

# **The Chronic Disease Self-Management Program (CDSMP) in Oklahoma**

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Zohre Salehezadeh, PhD  
Naneida Lazarte Alcala, PhD  
Candace Smith, MS

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## I. INTRODUCTION

Every day, thousands of Oklahomans cope with one or more incurable long-term health conditions such as cancer, diabetes, chronic pain, arthritis, and respiratory as well as cardiovascular diseases. As in other states in the nation, the prevalence of chronic diseases in Oklahoma is on the rise<sup>1</sup> and it is projected to increase steadily in the coming years as, among other factors, the population ages and these diseases become more frequent among younger adults, adolescents, and children.<sup>2</sup> Compared to rates for the total U.S. population, Oklahoma performs consistently poorer in many chronic disease indicators. For instance, cancer incidence, diabetes, arthritis prevalence among adults aged 18 years and older, and mortality rates due to cardiovascular diseases, are all higher in the state.<sup>3</sup>

Living with chronic conditions can significantly affect the well-being and quality of life of patients, as they often have to adjust their aspirations, lifestyles, and employment because of the limitations imposed on them by their disease(s) (Turner & Kelly, 2000). Patients' subjective assessment in those respects reveals negative impacts on their physical, mental, emotional, and/or social functioning (Wang *et al.*, 2008; Lam & Lauder, 2000). Older people are especially vulnerable to suffer marked decreases in their well-being as many chronic diseases are associated with advanced age (Rowe & Kahn, 1987, 1997).

Patients should have a central role in managing their chronic illness. This is because research shows that when they are fully engaged in their own health care, patient outcomes can improve (Coleman *et al.*, 2009; Holman & Lorig, 2000). This approach to care for patients with chronic conditions has been present in the literature for decades, including the widely known and adopted *Chronic Care Model* (Wagner, 1998) and the recent Institute of Medicine report on Living Well with Chronic Illness (Harris & Wallace, 2012).

Several Chronic Disease Self-Management Education (CDSME) programs have been developed with the goal of helping patients to gain self-efficacy in their ability to control their symptoms and to actively manage their health care. One of the programs that focuses on the chronically ill patient's active involvement and responsibility for his or her condition is the Chronic Disease Self-Management Program (CDSMP), which was developed in the 1990s by a research team at the Stanford University Patient Education Research Center. The overall goal of CDSMP is to enable participants to build self-confidence (i.e. *self-efficacy*) in their ability to manage their health and to maintain active and fulfilled lives. The program is well-suited for participants with different chronic diseases because this program focuses on symptoms that are common to most chronic conditions (e.g. fatigue, stress, pain, anger, and depression).<sup>4</sup> Unlike other self-management programs that are disease-specific, CDSMP is a self-management evidence-based intervention program for older people with one or more chronic conditions (Elzen *et al.*, 2007, Jonker *et al.*, 2009).

CDSMP has been offered in forty-seven states and the District of Columbia in the United States, and in 24 countries around the world.<sup>5</sup> Although it has been widely evaluated in the United States, Europe, Asia and Australia (Yukawa *et al.*, 2010; Richardson *et al.*, 2008; Kennedy *et al.*, 2007; Elzen *et al.*, 2007; Lorig *et al.*, 1996, 1999, 2001a, 2001b), only some of the published reports involve scientifically-based results that can establish causal connection between the treatment (i.e., participation in the program) and a

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<sup>1</sup> Council of State Governments, 2006.

<sup>2</sup> Wu *et al.*, 2000.

<sup>3</sup> Centers for Disease Control and Prevention, 2012.

<sup>4</sup> Stanford Patient Education Research Center, 2008.

<sup>5</sup> Stanford Patient Education Research Center website, 2012.

set of outcomes for individuals who have received the treatment (*see* Lorig *et al.*, 1999, 2003, 2006; Fu *et al.*, 2003; Griffiths *et al.*, 2005; Haas *et al.*, 2005; Swerissen *et al.*, 2006; Elzen *et al.*, 2007; Richardson *et al.*, 2008; Kennedy *et al.*, 2007). These ten studies used randomized controlled trials (RCTs) that allocated individuals with chronic conditions to participate or not to participate in the program at random. By randomly assigning participants, these studies controlled for possible selection bias which helps to assure the findings were the result of the intervention and not the selection of the groups.

In general, the core measurements and outcome variables in the ten studies listed above include *self-efficacy* (confidence to perform self-management behaviors, confidence to manage disease in general, confidence to achieve outcomes), *self-management behaviors* (exercise, cognitive symptom management, mental stress management/relaxation, use of community resources, communication with physician, and advance directives), *health status* (disability, social/role limitations, pain and physical discomfort, energy/fatigue, shortness of breath, psychological well-being/distress, depression, health distress, self-rated general health), and *health care utilization* (visits to physicians, visits to emergency department, hospital stays, and nights in hospital).

The 10 RCTs vary widely in terms of sample characteristics, study design, measurements, and outcome variables included in the analyses. The median age of the participants in the samples is between 49 and 77 years. The sample size range is 845 participants (109 participants – 954 participants). Aside from the outcome measurements included in the self-administered version of the Chronic Disease Self-Management questionnaire (Lorig *et al.*, 1996), some studies used additional scales to assess health/illness, pain, depression, and self-efficacy. The number of actual variables used to assess the core measurements ranged from one to eight, or they were measured using a combined scale. The most frequent time frame for follow-ups was six months.

Based on the statistical significance of the results and their consistency, the studies provide some evidence on the effectiveness of the program. According to the findings, the program led to improvements in physical exercise (*self-management behaviors*), health distress and social/role activities limitations (*health status*), and *self-efficacy*. They also suggest some beneficial effects on cognitive symptom management, mental stress management, and well-being. The results show no effect of CDSMP on *health care utilization*.

While all the studies recruited participants that had one or more chronic conditions, a number of them adjusted their intervention/assessment of effectiveness to suit specific study populations. Some of them adapted the program to meet cultural differences; others made adjustments for the specifics of a chronic condition; and others used innovative settings for delivering the program (e.g., the internet-based self-management program).

Since 2007, Oklahoma has successfully implemented the CDSMP across the state. The programs' workshops have been offered in almost one-third of its counties reaching out to thousands of participants. The programs' workshops have been taught in community organizations and in facilities within the Oklahoma Department of Corrections.

In this paper we will describe Oklahoma's efforts to implement the CDSMP across the state. Additionally, we will present the results of an evaluation of the effectiveness of this program on a sample of workshop participants. Based on the results obtained from previous studies, we expect to find some positive effects of CDSMP workshop on participants' health behaviors and health status. We did not include any self-

efficacy measures in our evaluation. The rest of the report is organized into several sections. Section II addresses the specifics of the CDSMP in Oklahoma and Section III discusses the effects of the program on a sample of workshop participants and presents the results of the data analysis for this sample. Finally, Section IV provides a summary of the report and explains the next steps planned for this program in Oklahoma.

## **II. THE CHRONIC DISEASE SELF-MANAGEMENT PROGRAM (CDSMP) IN OKLAHOMA**

### **II.1 History of the CDSMP in Oklahoma**

In 2006, the Oklahoma Department of Human Services' Aging Services Division (OKDHS ASD) partnered with the Oklahoma State Department of Health (OSDH) to develop and to implement evidenced-based prevention programs for Oklahomans aged 60 years and older. Funded by a U.S. Administration on Aging (AoA) grant, the goal of this project, referred to as "Living Longer, Living Stronger" (LLS) was to increase the quality of life and to decrease the complications of arthritis, heart disease, stroke, obesity, and other chronic conditions for persons residing in Oklahoma.

Since then and with help from partners such as OSDH, the Oklahoma Department of Corrections (ODOC), the Oklahoma Health Care Authority (OKHCA), Area Agencies on Aging (AAAs), local community-based and faith-based organizations, and others within the collaborative network, the LLS Partnership has been offering the Chronic Disease Self-Management Program (CDSMP) to Oklahomans. Today, CDSMP remains vital considering the high prevalence of chronic diseases in Oklahoma, the increasing size of Oklahoma's older population, the link between aging and the exacerbation of chronic health conditions, and the fact that Oklahoma has few evidence-based programs dedicated to addressing health-damaging behaviors such as physical inactivity and poor nutrition. In an effort to reach those Oklahoman's most likely to be affected by chronic conditions, CDSMP is offered both in community settings and in facilities within the ODOC.

In addition to CDSMP, Oklahoma also offers the Diabetes Self-Management Program (DSMP). Both the CDSMP and the DSMP are low-cost, evidence-based programs aimed at helping individuals to maintain independent living. CDSMP is primarily geared toward those with chronic conditions while DSMP is primarily geared toward those with Type 2 diabetes. Meeting for two-and-a-half hours, once a week, for six weeks (a total of 15 hours), CDSMP and DSMP workshop participants acquire information about their conditions and are taught skills related to managing various disease symptoms (e.g., fatigue, pain, shortness of breath), eating healthy, appropriate exercises, using medication properly, thinking positively, and working more effectively with health care providers.

Beyond learning about their conditions and acquiring key skills, program participants receive support from other community members coping with similar problems as well as from workshop leaders. Each workshop is facilitated by a pair of trained leaders who often have health problems of their own. Some of the educators are peer leaders (also known as lay-leaders) and some are professional leaders who have received training and certification from the Stanford Patient Education Center (also known as master trainers). Both lay-leaders and master trainers receive at least 20 hours of training. Workshop sessions are designed to be highly interactive and they are taught from a highly structured manual which emphasizes sharing experiences and self-managing the everyday symptoms associated with chronic conditions.

## **II.2 Data Collection**

The program evaluation in Oklahoma began with the implementation of the first workshop in May 2007. In addition to completing a 24-item registration form, the participants responded to a five page, 48-item pre-survey (with questions that were suggested by the Stanford Patient Education Center) at the first session, workshop and instructor evaluation surveys at the last session, and a post-survey six months later. The host agencies also responded to a five question survey every month for process evaluation purposes. The five questions covered issues related to the activities and progress host agencies had over the previous month, as well as to problems they faced and the strategies they used to solve those problems. In addition, the workshops were monitored at least one time over the course of six weeks by a master trainer who filled out a fidelity report. The evaluation packet also included an attendance sheet and reasons for non-participation to follow up with no-shows and those who dropped out. This information was also used for the process evaluation. The workshop instructors would call those who missed a session to see why they didn't show up and check any of the 13 reasons listed. The reason for this form was that the workshop implementation in Oklahoma began in rural areas where transportation problems are among many of the problems faced. Learning about these problems helped to improve the workshop settings (e.g., place, time and days of the next workshops, provision of transportation). These surveys and forms were modified or eliminated later after a good amount of data was collected to reduce the hosts', instructors', and participants' time spent on paperwork.

Currently, for each CDSMP and DSMP workshop, host agencies are asked to submit a workshop information cover sheet, a session attendance sheet, and registration forms. With these forms, it is possible to document workshop details, keep track of attendance by session for each participant, and record a small amount of data about participants' socio-demographic information. These forms can all be linked together for each participant. Participants also complete anonymous workshop evaluation surveys that allow them to provide workshop feedback. In addition, the fidelity of the CDSMP is assured by having qualified and trained monitors observe many of the workshop sessions while completing a fidelity report. Only participants in selected sites are asked to respond to the pre- and post-surveys. These surveys are administered for specific research projects. For example, to evaluate the impact of the CDSMP on prison inmates, participants at the ODOC sites (from December of 2011 through July 2012) were asked to respond to a pre-survey at the first session and two post surveys: one at the last session of the workshop and the second, six months later. The data collection for this project is almost complete and the findings will be published soon.

## **II.3 Descriptive Statistics of Oklahoma's CDSMP and DSMP Workshops and Participants**

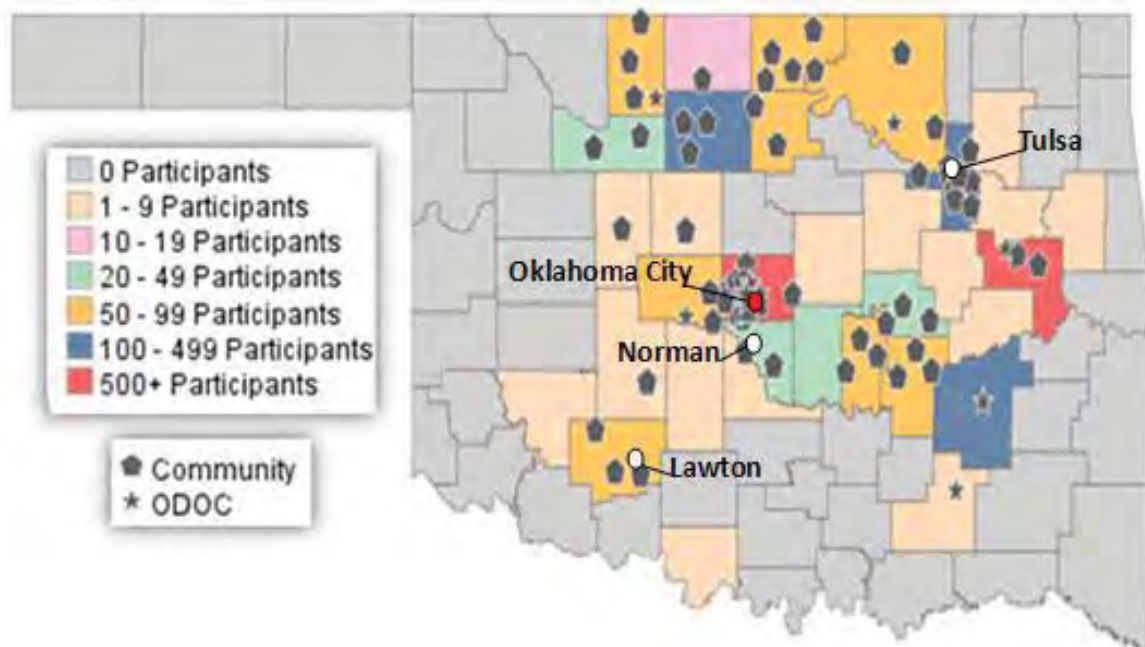
As of January 2013, over 3,700 participants have enrolled in a CDSMP or a DSMP workshop in the state of Oklahoma. There have been 321 workshops offered, including 314 CDSMP workshops which have served 3,624 participants and seven DSMP workshops which have served 84 participants<sup>6</sup>. Of the totality of these workshops and participants, 145 workshops were attended by 1,674 participants in the community. The remaining 176 workshops were attended by 2,034 participants in ODOC facilities. Average class size is 11.6 participants.

Overall, workshops have been offered in 22 of Oklahoma's 77 counties; participants from 33 counties have been able to attend one of these workshops (see Exhibit 1). The majority of the workshops have been held in and around the Oklahoma City and Tulsa metropolitan areas. Likewise, most of the participants have come from the central and northeastern parts of the state.

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<sup>6</sup> All of the DSMP workshops were offered in the community.

### Exhibit 1. Participants by County and Workshops by Zip Code



Source: Oklahoma Department of Human Services (OKDHS)-Office of Planning Research and Statistics (OPRS) (Workshop N = 321 (Community Workshop N = 145, ODOC Workshop N = 176), Participant N = 3,708 (Community Participant N = 1,674, ODOC Participant N = 2,034))

In terms of completer rates (i.e., workshop participants who attended four or more of the six offered workshop sessions), Oklahoma's overall completer rate is 81.6%. This is 7.1% points higher than the national completer rate of 74.5%. More specifically in regards to Oklahoma, the average completer rate for community participants is 71.1% while the average completer rate for ODOC participants is 90.2%.

In regards to socio-demographics, there are some substantial differences between program participants nationally and participants from Oklahoma. As an illustration, refer to Exhibit 2 which displays the aggregated socio-demographic characteristics for all participants and then the aggregated socio-demographic characteristics for Oklahoma participants. As can be seen, Oklahoma participants are, on average, younger, more likely to be male, more likely to live alone, and more likely to be racially and ethnically diverse than are participants nationally. Participants from Oklahoma also vary quite a bit from the rest of the nation when it comes to the prevalence of chronic diseases. Except for reports of depression and lung disease, Oklahoma participants are less likely to report experiencing chronic conditions compared to the national participants.

In actuality, the reason for these sometimes stark differences in areas like age, gender, living arrangement, race/ethnicity, and reports of chronic diseases is that the ODOC participants heavily influence Oklahoma's data as these participants are generally younger, more likely to be male, more likely to live alone (i.e., they don't live with any of their family members), more likely to be racially and ethnically diverse, and generally less likely to report suffering from a chronic condition than are community participants. As Exhibit 2 further demonstrates, the participants who come from community settings in Oklahoma very much resemble the nation's average participants.

**Exhibit 2. Socio-Demographic Characteristics of Participants in the U.S. and OK**

	<b>Nation (Overall)</b>	<b>Oklahoma (Overall)</b>	<b>Oklahoma (Community)</b>	<b>Oklahoma (ODOC)</b>
<b>Age</b>				
Age 60+	73.10%	36.08%	76.06%	3.86%
<b>Gender</b>				
Female	77.60%	50.07%	78.24%	27.26%
<b>Living Arrangement</b>				
Living alone	46.00%	78.50%	50.70%	100.00%
<b>Race/Ethnicity</b>				
White	66.30%	56.76%	64.52%	50.41%
African American	21.40%	25.42%	22.64%	27.69%
Asian	3.60%	0.77%	1.45%	0.21%
Native Hawaiian/Pacific Islander	0.90%	0.09%	0.13%	0.05%
American Indian/Alaska Native	1.60%	8.68%	4.87%	11.80%
Other	4.20%	1.74%	1.08%	2.28%
Multi-racial	1.90%	6.55%	5.31%	7.56%
Unknown	16.40%	5.26%	5.56%	5.01%
Hispanic/Latino	17.00%	6.54%	3.06%	9.18%
<b>Chronic Diseases</b>				
Multiple conditions	60.20%	45.60%	60.51%	33.33%
Hypertension	43.10%	35.86%	48.12%	25.74%
Arthritis	40.80%	30.96%	46.98%	17.75%
Diabetes	30.40%	17.29%	28.27%	8.23%
Depression	19.60%	26.51%	19.57%	30.72%
Lung disease	16.40%	17.78%	17.57%	17.95%
Heart disease	15.90%	11.40%	19.25%	4.93%
Osteoporosis	12.10%	6.35%	14.88%	1.18%
Cancer	9.00%	5.76%	9.38%	2.76%
Stroke	4.80%	4.58%	8.86%	1.99%
Other	25.20%	20.78%	23.85%	18.24%
None	18.60%	28.94%	20.79%	35.64%

Sources: National Statistics: CDSMP Portal Site (Participants N = 120,988); OK Statistics: OKDHS-OPRS (Participants N = 3,708 (Community Participants N = 1,674, ODOC Participants N = 2,034))

### III. THE EFFECTS OF CDSMP ON A SAMPLE OF WORKSHOP PARTICIPANTS IN OKLAHOMA

For the purposes of this report, data collected from a sample of community CDSMP participants were evaluated in an effort to gauge the effectiveness of Oklahoma’s CDSMP workshops. More specifically, data from those community participants who completed both the pre-survey and the post-survey between May of 2007 and January of 2010 are analyzed here. As discussed earlier, community participants completed the pre-survey at the start of the workshop and completed the post-survey six months following workshop completion. Program evaluation in the community stopped in January 2010 because the



response rate to the post-survey was very low and because instructors were complaining that some participants were discouraged from coming back to the workshop after the first session due to the number of forms that they were asked to complete. Of the 540 community CDSMP workshop participants who completed forms at the first workshop<sup>7</sup>, only 104 participants completed the post-survey. This provides a response rate of 19.3%. The following data analyses are based on the information provided by these 104 participants.

### III.1 Data Collection Tools, Methods, and Timeframe

The workshop participants filled out a registration form at the beginning of the workshop in addition to responding to the pre-survey. The registration form collects basic demographic data and is linked to the participants' pre- and post-surveys and to their attendance records. The pre- and post-surveys were developed to measure the impact of the training on the participants. Two participant's evaluation surveys and a fidelity report were also developed to measure the quality of the program offered, adherence to the original program content, and the participants' satisfaction with the workshop, program, and instructors. The instructors conducted the pre-survey—a pen-and-paper survey—before the workshop started. For the post-survey, invitation cards were sent out to the participants inviting them to a reunion party during which the post-survey was to be conducted. The instructors then mailed the post-survey along with a self-stamped envelope to the participants who did not show up for the reunion party.

The pre- and post-surveys completed by the participants were comprised of 43 identical items that included topics like health status (23 items), health behaviors (15 items), and health care utilization (five items). As mentioned previously, these items have been tested, used, and recommended to be used for the evaluation of health promotion intervention programs by the program developers at Stanford University.<sup>8</sup>

### III.2 Demographic Data of the Selected Participants

The data collected from the 104 participants who filled out the registration form and responded to the pre-survey as well as the post-survey attended one of the 15 workshops held from May 2007 through January 2010. These workshops took place in rural areas of northern Oklahoma and in the Oklahoma City metropolitan area. The completion rate<sup>9</sup> among this group of participants was 92.3%. The demographic data collected through the registration forms indicate the majority of the participants were female (77.5%), white (97.8%), lived alone (60.6%), and over the age of 65. In fact, the mean age of this group was 76.5 years and the median age was 77.7 years (see Exhibit 3).

**Exhibit 3. CDSMP Selected Workshop Participants' Age**

<b>Age Categories</b>	<b>Frequency</b>	<b>Percent</b>
<b>Under 65</b>	13	12.5%
<b>65 - 84</b>	63	60.6%
<b>85+</b>	25	24.0%
<b>Missing data</b>	3	2.9%
<b>Total</b>	104	100.0

Source: OKDHS-OPRS (Participants N = 104)

A summary of other demographic characteristics of the participants are presented in Exhibit 4 including a breakdown of the prevalence of various chronic diseases experienced among the participants.

<sup>7</sup> All of these 717 participants attended a CDSMP as opposed to a DSMP workshop.

<sup>8</sup> Lorig, *et al.*, 1996.

<sup>9</sup> A participant who attends four or more of the six workshop sessions is considered to have completed the course.

**Exhibit 4. CDSMP Selected Workshop Participants' Other Demographic Characteristics**

<b>Characteristics</b>	<b>Frequency</b>	<b>Percent</b>
<b>Education</b>		
Less than high school	7	6.7%
Some high school	10	9.6%
High school graduate or GED	37	35.6%
Some college or vocational school	30	28.8%
College graduate	10	9.6%
Graduate school	3	2.9%
<b>Race/Ethnicity</b>		
White/Caucasian <sup>10</sup>	91	87.5%
Black/African American	8	7.7%
American Indian/Alaska Native	4	3.8%
Hawaiian Native/Pacific Islander	1	1.0%
Asian/Asian-American	0	0.0%
Hispanic/Latino	0	0.0%
<b>Marital Status</b>		
Married	25	24.0%
Divorced	13	12.5%
Widowed	46	44.2%
Married, but Separated	10	9.6%
Never married	5	4.8%
<b>Annual Household Income</b>		
Less than \$5,000	13	12.5%
\$5,000 - \$14,999	39	37.5%
\$15,000 - \$24,999	24	23.1%
\$25,000 - \$49,999	8	7.7%
\$50,000 - \$75,000	2	1.9%
<b>Chronic Diseases</b>		
Arthritis/rheumatic or other joint disease	70	67.3%
Hypertension (High Blood Pressure)	53	51.0%
Heart disease	31	29.8%
Diabetes	26	25.0%
Other	25	24.0%
Lung disease	16	15.4%
Cancer	10	9.6%
Other	6	5.8%

Source: OKDHS-OPRS (Participants N = 104)

Note: Missing data not included unless otherwise noted.

As the data in Exhibit 4 indicates, most of the participants (51.9%) reported having low levels of education (i.e., a high school diploma or less), being white, living in low-income households,<sup>11</sup> and having multiple chronic conditions. These participants also reported suffering from arthritis and other

<sup>10</sup> One person selected both white and “other” for the race question.

<sup>11</sup> A cross tabulation of the household size and annual income (not presented here) shows that the majority of the participants were either living in poverty or from low-income families.

joint diseases and having high blood pressure more frequently than any of the other listed chronic diseases. The mean number of chronic conditions for this group was 2.2 conditions. Six participants reported having no chronic conditions. Three of these participants were under 60 years and the other three were 80 years old or older. The majority of the participants reported having health insurance coverage; many of them had multiple forms of coverage: Medicare 78%, Medicaid 14%, private insurance 29%, and 27% reported having “other” insurances. Only 12 people (11.5%) did not have any form of insurance.

### **III.3 Outcome Measures**

Three categories of outcomes were assessed: health status, health behaviors, and health care utilization. These measures and their components are explained below.

#### *III.3.1 Health Status*

Measures in this group included self-rated health (rating of health as excellent, very good, good, fair, or poor—a single-item scale), disability (difficulty with dressing, rising, eating, walking, hygiene, gripping, and similar activities—an eight-item Likert scale),<sup>12</sup> health distress (amount of time in the past four weeks that one felt distressed about health (worried, discouraged, or frustrated about health problems—a four-item Likert scale), and social/role activities limitation (the impact of disease on multiple aspects of one’s daily life such as the extent to which the illness has interfered with social and recreational activities, chores, errands, and spiritual activities—a six-item scale). Other measures in this group assessed symptoms (the extent to which the participants experienced pain, fatigue, and shortness of breath using visual numerical scales from having no problem to having severe problems with each of these symptoms—three separate ordinal items) and whether or not participants perceived themselves as being disabled (a dichotomous item).

#### *III.3.2 Health Behaviors*

To assess this group of outcomes, we used measures such as the level of exercise, cognitive symptom management, and communication with physician and health care provider. Following Dr. Lorig and her colleagues’ method,<sup>13</sup> we used a single item to capture the amount of time the participant spent on stretching/strengthening exercises (i.e., range-of-motion exercise) during the past week (ordinal scale converted into minutes) and a five-item scale to capture the time in the past week the participant spent on aerobic exercise, swimming or aquatic exercise, walking for exercise, bicycling or using a stationary bike, other aerobic exercise equipment, or other aerobic exercises (sum of ordinal scales converted to minutes). The cognitive symptom management scale measures how often someone practices various techniques and cognitive strategies (such as trying to feel distant from the discomfort, playing mental games, singing songs to keep mind off the discomfort, using progressive muscle relaxation, using visualization or guided imagery, talking to self in positive ways) to better cope with the disease symptoms (a six-item Likert scale). Communication with physician included items to assess the frequency of preparing a list of questions, asking questions about things that the person doesn’t know about/doesn’t understand, and discussing personal problems related to the illness when visiting a doctor or nurse practitioner (a three-item Likert scale).

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<sup>12</sup> Following Dr. Lorig and her colleagues’ methodology, we have calculated the score for this and other scales. The score for this scale, for example, is the mean of the eight items. If more than two items were missing, we set the value of the score to missing. Scores range from zero to three, with a higher score indicating more disability.

<sup>13</sup> Lorig, et al., 1996, 2001a, 2001b.

### III.3.3 Health Care Utilization

Five types of health care utilization were assessed: visits to doctor/nurse practitioner/health clinic, visits to hospital emergency rooms, number of hospitalizations, number of nights stayed in a hospital, and number of prescription medications used on a regular basis. For each item, a count of visits/stays/nights/prescription medications was asked.

### III.4 Results

Paired t-tests were used to assess changes in outcome measures, described above, from the pre-survey data to the post-survey data. These three measures along with their related items are presented in Exhibit 5. In regards to health status, the results show that even though there were improvements in five out of the nine health status measures, only two of them were statistically significant: health distress and self-rated health.<sup>14</sup> This means that the improvements in the other three measures could have been by chance. The changes in four measures were in the opposite direction than expected, but none of them were statistically significant.

**Exhibit 5. Measures Used and Outcomes from the Pre-Survey and Post-Survey**

Measure	Number of Items	Mean Baseline	Mean 6-month follow up	Change in mean	P value	N	Improved/Worsened	Statistically significant?
<b>1) Health Status</b>								
Perceived self as disabled*	1	1.63	1.56	-0.07	0.58	16	Improved	N
Health distress	4	1.69	1.52	-0.17	0.04	103	Improved	Y
Social/role activity limitation	6	2.70	2.94	0.24	0.24	85	Worsened	N
Pain	1	4.50	4.05	-0.45	0.10	103	Improved	N
Shortness of breath	1	2.72	2.80	0.08	0.71	102	Worsened	N
Fatigue	1	4.57	4.40	-0.17	0.50	88	Improved	N
Self-rated health	1	3.40	3.05	-0.35	0.00	104	Improved	Y
Disability	8	1.24	1.29	0.05	0.09	102	Worsened	N
<b>2) Health behaviors</b>								
Aerobic exercise**	5	88.56	108.60	20.04	0.05	104	Improved	Y
Range-of-motion exercise**	1	49.62	49.90	0.28	0.96	104	Improved	N
Cognitive symptom management	6	1.37	1.58	0.21	0.05	97	Improved	Y
Communication with physician	3	2.15	2.16	0.01	0.93	101	Improved	N
<b>3) Health care utilization</b>								
Number of medications	1	5.63	6.22	0.59	0.18	81	Worsened	N
Physician/nurse practitioner visits	1	3.03	3.01	-0.02	0.96	96	Improved	N
Emergency department visits	1	0.30	0.24	-0.06	0.47	98	Improved	N
Hospitalizations	1	0.24	0.19	-0.05	0.55	96	Improved	N
Nights in hospital	1	0.72	0.94	0.22	0.56	94	Worsened	N

\*The question was: Do you consider yourself to be a person with disability? Yes, No

\*\*Total amount of time (in minutes) per week.

<sup>14</sup> In statistics "**significant**" means **probably true** (not due to chance). It doesn't mean it is important. A statistically significant change is determined by the p value. The p value in each row tells us how likely something is to be not true. For example, for health distress p value = .04 means that there is only 4% chance that the change is not true (i.e., 96% chance that the difference is true), while the p value of .96 for the range-of-motion exercise means that there is a probability of 96% that the change over time (from pre to post) was not true (there is only a 4% chance that the difference is true).

For the second outcome measure, health behavior, the results of the t-tests show that despite the fact that there was improvement in all four items, only two of the changes were statistically significant: there was a statistically significant improvement in the amount of time the participants spent on aerobic exercise and the use of cognitive techniques.<sup>15</sup>

Finally, for the third outcome measure, health care utilization, there were no significant differences between the pre- and post-survey data. There appears to be trends toward fewer emergency department visits, but the probability of this being a true statement is only slightly over 50%.

### **III.5. Discussion and Conclusions**

The data analysis presented in the previous section indicates that CDSMP workshop participation was associated with better outcomes<sup>16</sup> in several aspects of the participants' lives: lower health distress, improved self-rated health, increased amount of time spent on exercise, and increased use of cognitive symptom management. There were no statistically significant changes in medical care utilization. These results are not as impressive as the results of some other studies conducted by Dr. Lorig and her colleagues, but there are also several studies that didn't show any impact on the health care utilization (see for example the ten randomized controlled trial studies discussed in the Introduction). One reason could be that the participants in this "study" were generally older (median age was 77.7 years), more ill (the average number of chronic diseases for this group was 2.2), frailer, and more apt to develop additional health issues as time elapsed. The poor outcomes could also be attributed to the participants' lower education.<sup>17</sup> Another factor that may have contributed to the lower than expected outcomes is the fact that the participants in this study were not recruited as "study subjects," nor were the workshops designed as a controlled study environment like most other studies.<sup>18</sup> Rather, these workshops were offered by two Area Agencies on Aging, one in rural areas of northern Oklahoma and another one in the Oklahoma City metro area.

It is important to acknowledge several limitations of these results. First, we need to consider the spurious correlation which means that the improvements in outcomes may have been caused by factors other than attending the CDSMP workshop. Second, it is important to note that there was not much racial diversity among the participants. In other words, the results could not be extrapolated to a nonwhite population. Another limitation is with regards to those with incomplete data. The analysis presented in this study was based on the data collected at the beginning of the workshop and six months following workshop completion. Many of those who took the pre-survey did not respond to the post-survey and so it could be that those who had more diseases were less likely to attend the reunion party. A final positive point to consider is that we need more time to investigate the effectiveness of this program. In other words, these may only be partial outcomes of the program.

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<sup>15</sup> It is possible that this increase is an indication of their worsened disease and so the participants experienced more pain and other discomforts and so had to use the techniques more often.

<sup>16</sup> These improvements were statistically significant.

<sup>17</sup> In several effectiveness studies the participants had a mean education of over two years of college (i.e., 14+ years of education), but in this study the majority of the participants had a high school diploma or less.

<sup>18</sup> The logic behind this factor is that the participants in controlled environment know they are being tested so they are expected to respond favorably if they just enjoyed the workshop for reasons other than content.

#### **IV. SUMMARY AND NEXT STEPS**

Oklahoma has been successfully implementing the CDSMP across the state through the Living Longer, Living Stronger Partnership since 2007. About 4,000 elderly, disabled, or at-risk Oklahomans have been served in workshops that provide training on how to better manage their chronic conditions based on a curriculum developed by the Stanford University Patient Education Research Center. The partnership has recently begun offering Diabetes Self-Management Program which is a similar program tailored for people with Type 2 diabetes.

The data collected from a sample of workshop participants in Oklahoma indicates that the CDSMP had a small, but statistically significant effect on the participants. Specifically, the participants had lower health distress (measured as the amount of time in the past four weeks the person felt distressed about her/his health—such as being worried, discouraged or frustrated about health problems), improved self-rated health, increased amount of time exercising, and increased use of cognitive techniques taught in the workshop six months after attending the workshop. The analyses did not show any statistically significant impact on the medical utilization. These results were in accordance with other previous studies conducted across the U.S. and other countries.

The next steps for the CDSMP in Oklahoma include offering CDSMP and DSMP workshops in the far western and southeastern portions of the state and reaching out to a higher number of American Indian and Hispanic persons over the next few years. For Spanish-speaking Oklahomans, this means expanding the LLS Partnership to include Latino partners and offering Tomando Control de su Salud with the new grant funding from the AoA.

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