

# Self-Management Program Participation by Older Adults With Diabetes

## Chronic Disease Self-Management Program and Diabetes Self-Management Program

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The Chronic Disease Self-Management Program and the Diabetes Self-Management Program offer evidence-based self-management for persons with diabetes. We examined participation and completion rates for older adults in the *Communities Putting Prevention to Work* initiative and found that completion is more likely (1) in Diabetes Self-Management Program for individuals with diabetes; (2) for Chronic Disease Self-Management Program and Diabetes Self-Management Program with introductory class zero; and (3) in small classes. We also found that participants reporting depression were less likely to complete either workshop. Future research is needed to examine workshop availability and selection, health and behavioral outcomes, and participant/completer experience. **Key words:** *chronic disease self-management program, diabetes, older adults*

**D**IABETES mellitus is among the most highly prevalent chronic conditions and a leading cause of disability and death among older adults, affecting 10.9 million adults aged 65 years and older (26.8%) in the United States.<sup>1</sup> Diabetes can lead to serious medical complications such as kidney failure, lower limb amputations, adult onset blindness, obesity, hypertension, nerve damage, heart disease, and stroke. These conditions com-

PLICATE treatment and increase related spending, estimated at \$176 billion in direct medical costs with an additional \$69 billion in reduced productivity in 2012.<sup>2</sup>

Evidence-based self-management education and training programs have been widely implemented to help older adults manage their diabetes, showing improved psychosocial and clinical outcomes for participants in a recent systematic review.<sup>3</sup> Two popular self-management programs for individuals with diabetes are the Chronic Disease Self-Management Program (CDSMP) and the Diabetes Self-Management Program (DSMP), translated from research for broad dissemination by Stanford University. Grounded in Bandura's self-efficacy theory, CDSMP and DSMP are designed to help empower individuals to take charge of their self-care.<sup>4</sup>

Both CDSMP and DSMP are offered as a series of highly participative 2.5-hour sessions once a week for 6 weeks. Ideal workshop sizes (recommended by Stanford University) range from 10 to 16 participants and are offered in community settings such as churches, area

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agencies on aging, senior centers, community health centers, local health departments, and hospitals.<sup>5</sup> Ideally, the workshops are facilitated by 2 trained peer leaders, 1 or both of whom have any chronic condition (CDSMP) or diabetes specifically (DSMP). Peer leaders and participants discuss the material and problem-solve together to support each participant in developing strategies and action plans to address their personal challenges relating to session topics. Participants use a workbook developed by Stanford and are given assignments to be prepared as “homework” prior to each session. They are also asked to develop an action plan with goals that they discuss with peers in the sessions. Most sites provide the program free-of-charge or at a nominal fee, with many making lending library arrangements for sharing program materials.

Both CDSMP and DSMP use a similar workshop format but focus on different topics. Chronic Disease Self-Management Program uses a general approach to chronic condition self-management including participants with diabetes along with participants who have 1 or more chronic conditions, for example, hypertension, arthritis, or osteoporosis. Diabetes Self-Management Program includes general topics as well as a specific emphasis on diabetes and its management. Chronic Disease Self-Management Program workshops address general topics relating to the management of a wide range of chronic conditions including (1) techniques to deal with problems such as frustration, fatigue, pain, and isolation; (2) appropriate exercise for maintaining and improving strength, flexibility, and endurance; (3) appropriate use of medications; (4) communicating effectively with family, friends, and health professionals; (5) nutrition; (6) decision making; and (7) how to evaluate new treatments.<sup>6</sup> The diabetes-specific DSMP workshops cover topics including (1) techniques to deal with the symptoms of diabetes, fatigue, pain, hyper/hypoglycemia, stress, and emotional problems such as depression, anger, fear, and frustration; (2) appropriate exercise for maintaining and im-

proving strength and endurance; (3) healthy eating; (4) appropriate use of medication; and (5) working more effectively with health care providers.<sup>7</sup>

Both self-management programs have demonstrated effectiveness in clinical studies. Studies show that workshop participants, compared with those who did not participate in CDSMP, had significant self-reported improvements in exercise, cognitive symptom management, communication with physicians, self-reported general health, health distress, fatigue, disability, and social/role activities limitations, as well as fewer hospitalizations and spent fewer days in the hospital.<sup>8,9</sup> Studies of DSMP, originally developed as a Spanish language program, showed that participants, compared with those who did not participate in DSMP, demonstrated improvements in health behaviors, health status, and self-efficacy at both 4 months and 1 year after program participation.<sup>7</sup> Another study of Spanish language DSMP reported effectiveness in lowering A<sub>1c</sub> (average blood glucose level) and improving health status and self-efficacy, although increases in positive health behaviors were not identified.<sup>10</sup> An English language version and an Internet-based version of the program have subsequently been developed.<sup>7</sup>

The US Administration on Aging (AoA), now part of the US Administration for Community Living (ACL\*), has supported community-based chronic disease self-management education programs since 2003. In 2010, authorized by the American Recovery and Reinvestment Act of 2009, the ACL/AoA funded 45 states, the District of Columbia, and Puerto Rico to expand and implement CDSMP and DSMP through the Communities Putting Prevention to Work: Chronic Disease Self-Management Program initiative, conducted in collaboration with the Centers for Disease Control and

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\*In April 2012, AoA, the Office on Disability, and the Administration on Developmental Disabilities were combined into ACL, a single agency with the U.S. Department of Health and Human Services. AoA is now a part of ACL.

Prevention and the Centers for Medicare & Medicaid Services. The ACL/AoA also funded a multimethod national process evaluation including site visits, interviews with grantees and delivery site representatives, review of program reports, and assessment of program administrative data to assess program implementation and dissemination. Examining best practices used by grantees to enroll participants to complete the self-management workshops was an important evaluation focus.

Participants self-refer to the programs. Marketing and outreach can be conducted by state departments of aging or public health, by regional groups or organizations such as Aging and Disability Resource Centers involved with older adults, by delivery sites such as area agencies on aging and other community-based organizations, or by a combination of these organizations. Some delivery sites offer both CDSMP and DSMP, others offer one or the other program, with CDSMP being most widely available in communities nationwide. The American Recovery and Reinvestment Act-funded programs were open to all interested individuals, although the focus was on older adults. Caregivers of individuals with chronic conditions also sometimes participate in the sessions. Sites generally attempt to include all interested participants unless they have serious behavioral issues that may disrupt sessions, which is rare.\* Individuals with diabetes can participate in DSMP or CDSMP. However, little is known about the characteristics of participants and workshops for DSMP and CDSMP and the likelihood of participants with diabetes completing these programs. Our interest in comparing the programs emerged from our experiences with workshop leaders and master trainers we interviewed during visits and phone calls to sites that offered both CDSMP and DSMP

workshops. Leaders at some sites thought that there were no differences in participant recruitment, types of participants who self-selected into workshops, or benefits to be derived from attending either CDSMP or DSMP. Others, including individuals experienced in facilitating both workshops at sites offering both programs, shared strong opinions that DSMP was a preferred option for individuals with diabetes given the condition-specific focus of the sessions. Given that leaders could provide only anecdotal evidence, several told us that they would be interested in knowing more about the topic and encouraged the research team to investigate differences between the programs.

In response, this study examines participants and completers with diabetes in CDSMP and DSMP offered by grantees of the Communities Putting Prevention to Work initiative to understand differences among participants and whether completion rates for participants with diabetes are higher in general CDSMP or condition-specific DSMP workshops. Noted previously, these issues emerged as questions during discussions with practitioners and can help inform efforts to optimize self-management program completion by participants with diabetes.

## METHODS

This study is based on program administrative data submitted by the 47 ACL/AoA grantees as part of the Communities Putting Prevention to Work initiative. These data were submitted by grantees to the ACL's technical assistance organization, the National Council on Aging on CDSMP and DSMP workshops conducted during the period April 1, 2010, through March 30, 2012, and on the participants and leaders involved in those workshops. The data contain information from 7749 CDSMP and 1119 DSMP workshops that served 89 861 and 12 533 participants, respectively, over the American Recovery and Reinvestment Act grant period.

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\*The research team explored these issues in discussion with individuals during site visits and phone conversations.

**Table 1.** Demographic Characteristics<sup>a</sup>

Subgroup	N	Female, %	Male, %	Average Age, y
<b>CDSMP</b>				
Diabetic	23,579	74.8	23.5	67.58
Nondiabetic	66,282	71.0	19.4	66.31
ALL	89,861	72.0	20.5	66.67
<b>DSMP</b>				
Diabetic	8,311	75.2	23.9	68.27
Nondiabetic	4,222	67.1	17.4	66.86
ALL	12,533	72.5	21.7	67.87

Abbreviations: CDSMP, Chronic Disease Self-Management Program; DSMP, Diabetes Self-Management Program.

<sup>a</sup>Shares of males and females may not add up to 100% because of participants with unknown gender. Average age calculation excludes participants with missing age information.

We conducted 2 types of analyses. First, we provided descriptive statistics detailing the composition of the participants in the 2 programs. Chronic Disease Self-Management Program and DSMP implementation sites use a variety of methods to recruit potential participants. In addition, participants self-selected themselves into 1 of the 2 workshops potentially based on the likelihood of benefiting from completing the program conditional on his/her needs. Hence, we compared the demographic makeup of the CDSMP and DSMP participants such as age, gender, race/ethnicity, and chronic conditions. We then examined the completion rates for the 2 programs in a multivariate logistic regression analysis. A participant is considered to have completed the program if he or she participated in at least 4 of 6 sessions of a workshop.\* In the regression analysis, we include a variety of explanatory variables to investigate whether the effect of any of these factors is different for completion of CDSMP than DSMP, with a focus on the effect of chronic conditions (eg, diabetes).

## FINDINGS

Most ACL/AoA grantees offered CDSMP, with fewer offering DSMP. As a result, availability of DSMP workshops (1119 vs 7749) and the number of DSMP participants (12 533 vs 89 861) were relatively smaller than those of the CDSMP. Given that the main difference between the 2 programs is the focus on individuals with diabetes in the DSMP, our analyses address 2 subgroups of participants within each of the programs (Table 1). There were no major differences between the DSMP and the CDSMP with respect to the share of female and male participants and average age. However, the percentage of males was higher in both DSMP and CDSMP among diabetic participants.

The race and ethnicity of participants in DSMP and CDSMP are summarized in Table 2, which shows that, overall, higher shares of Hispanics and African Americans participated in DSMP than in CDSMP (18.2% vs 13.1% and 27.8% vs 17.3%, respectively). Conversely, the proportion of white participants is lower in DSMP than in CDSMP (46.7% vs 56.3%). This finding held regardless of whether participants had diabetes or not. Finally, the share of African American participants is the largest among diabetic DSMP

\*Definition provided by Stanford University and adopted by NCOA/AoA.

**Table 2. Race/Ethnicity Among CDSMP and DSMP Participants<sup>a</sup>**

Subgroup	Hispanic, %	Not Hispanic, %	White, %	African American, %	American Indian or Alaskan Native, %	Asian or Asian American, %	Hawaiian Native or Pacific Islander, %	Multirace, %	Unknown Race, %
	CDSMP								
Diabetic	16.1	72.0	56.9	22.5	1.6	3.1	1.4	5.8	8.6
Nondiabetic	12.1	65.4	56.0	15.5	1.3	3.2	0.6	4.8	18.7
<b>ALL</b>	<b>13.1</b>	<b>67.2</b>	<b>56.3</b>	<b>17.3</b>	<b>1.4</b>	<b>3.2</b>	<b>0.8</b>	<b>5.0</b>	<b>16.0</b>
DSMP									
Diabetic	17.8	67.9	50.8	31.1	1.2	1.8	0.4	7.0	7.8
Nondiabetic	19.1	52.3	38.5	21.4	0.6	1.9	0.3	7.9	29.3
<b>ALL</b>	<b>18.2</b>	<b>62.6</b>	<b>46.7</b>	<b>27.8</b>	<b>1.0</b>	<b>1.9</b>	<b>0.4</b>	<b>7.3</b>	<b>15.0</b>

Abbreviations: CDSMP, Chronic Disease Self-Management Program; DSMP, Diabetes Self-Management Program.  
<sup>a</sup>Shares of Hispanic and non-Hispanic may not add up to 100% because of participants with unknown ethnicity.

participants with 31.1%. While African American and Hispanic older adults have a higher prevalence of diabetes than non-Hispanic whites, these findings are not population-based but are based on observation and could represent enrollee groups referred to or targeted by state grantees for CDSMP or DSMP, availability of one or the other program in communities of interest, or participant preferences for enrollment in either program when both were available.

Table 3 shows the distribution of participants and workshops by type of site where the workshops were offered. The distribution of both participants and workshops by type of implementation showed some variation between DSMP and CDSMP. The DSMP utilized senior centers more than the CDSMP (33.6% vs 22.4% of workshops) and all other types of sites less than the CDSMP. Again, our findings are based on observational data, so we can describe the setting but cannot explain whether settings were selected by grantees or participants.

As part of the enrollment process for both CDSMP and DSMP, participants are asked whether or not they suffer from a list of chronic illnesses: arthritis, cancer, depression, diabetes, heart disease, hypertension, lung disease, stroke, osteoporosis, and other. Table 4 shows the self-reported prevalence of these chronic illnesses among DSMP and CDSMP participants. Chronic Disease Self-Management Program participants with and without diabetes had a greater average number of chronic conditions than DSMP participants (3.42 vs 2.83 among diabetic participants and 1.77 vs 1.27 among nondiabetic participants). As expected, a significantly higher proportion of DSMP participants indicate having diabetes than CDSMP participants (66.3% vs 26.2%). The prevalence of other chronic illnesses is generally higher among CDSMP participants (eg, 42.4% vs 34.5% for arthritis, 20.8% vs 14.6% for depression) except for hypertension (43.6% vs 47.1%). This could be because high blood pressure is a common comorbidity of diabetes.

**Table 3.** Workshops and Participants by Implementation Site in CDSMP and DSMP

Type of Site	CDSMP		DSMP	
	Workshops, %	Participants, %	Workshops, %	Participants, %
Area Agency on Aging	4.7	4.7	2.6	2.8
Faith-based organization	8.4	8.7	7.5	7.7
Health care organization	23.2	21.7	19.3	18.9
Residential facility	17.0	18.0	13.2	13.1
Senior center	22.4	23.4	33.6	33.0
Other <sup>a</sup>	24.2	23.6	23.8	24.3
Total	100.0	100.0	100.0	100.0

Abbreviations: CDSMP, Chronic Disease Self-Management Program; DSMP, Diabetes Self-Management Program.

<sup>a</sup>Organizations grouped under “other” category include county health departments, educational institutions, libraries, multipurpose social services organizations, recreational organizations, tribal centers, workplaces, and other unspecified locations.

However, more information is needed to better understand these trends.

A question often raised in discussions with grantees was whether individuals with diabetes were more likely to benefit from, or to complete, CDSMP or DSMP. Our analyses are based on administrative data that do not enable examination of actual outcomes or benefits. However, each grantee had “completer” goals (completers are participants who attend at least 4 of the 6 sessions). While participants may benefit from self-management workshops even if they are not completers, completion is used as a proxy for success, tied to Stanford’s fidelity standards. Therefore, we examined whether participants with diabetes were more or less likely to complete CDSMP or DSMP workshops.

As Table 5 shows, although DSMP is a relatively smaller program (in terms of number of workshops and participants), completion rates were higher than CDSMP without controlling for other factors that might affect completion (77.9% vs 74.5%). In addition, completion rates were higher by about 3 percentage points in both programs for participants with diabetes. At 80.7%, completion rates for individuals with diabetes taking DSMP were the highest among the 4 groups compared.

## REGRESSION ANALYSIS OF COMPLETION RATES

We conducted regression analyses to better understand the variation in completion rates by observable factors, such as participant characteristics (eg, age, gender, race, chronic illnesses), workshop-related information, and differences across states (eg, how the programs are administered). We hypothesized that DSMP is a “better” program than CDSMP for individuals with diabetes, because DSMP participants are relatively more homogeneous in terms of conditions and DSMP is customized for the needs of such individuals. The previous analysis (Table 5) showed that the proportion of participants with diabetes and hypertension was higher than it is in CDSMP, and the converse is true for all other chronic illnesses. So, the purpose of this analysis is to investigate whether the prevalence of the chronic illnesses affects the likelihood of a participant completing the program (DSMP or CDSMP), and hence potentially benefiting from the workshop.\*

\*Data on health outcomes are not available, so examination of program effectiveness is out of the scope of this study.

**Table 4.** Chronic Illnesses Among CDSMP and DSMP Participants

Subgroup	Average Number of Arthritis Conditions		Cancer, %		Depression, %		Diabetes, %		Heart Disease, %		Hypertension, %		Lung Disease, %		Stroke, %		Osteoporosis, %		Other, %	
			%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%	%
CDSMP	3.42	51.1	10.9	24.7	100.0	25.5	63.2	21.6	7.5	11.7	26.2									
Diabetic	1.77	39.3	8.6	19.5	0.0	13.0	36.6	15.4	4.1	13.1	27.1									
Nondiabetic	2.20	42.4	9.2	20.8	26.2	16.3	43.6	17.0	5.0	12.7	26.9									
DSMP	2.83	37.7	9.4	16.6	100.0	18.4	53.9	16.2	6.2	9.7	14.6									
Diabetic	1.27	28.1	6.1	10.5	0.0	9.8	33.6	10.8	3.0	10.1	15.1									
Nondiabetic	2.30	34.5	8.3	14.6	66.3	15.5	47.1	14.3	5.1	9.9	14.8									

Abbreviations: CDSMP, Chronic Disease Self-Management Program; DSMP, Diabetes Self-Management Program.

We use a logistic regression analysis to investigate the effect of a variety of explanatory (or predictor) variables on the likelihood of program completion (attending at least 4 of 6 sessions). The dependent variable is a binary (dummy) variable that is equal to 1 if the participant attended at least 4 sessions, and 0 otherwise. The list of explanatory variables includes

- demographic information derived from participant characteristics, such as age, sex, and race/ethnicity;
- health information, such as chronic conditions reported by the participant;
- information related to the implementation site and workshop; and
- external data not directly available in the National Council on Aging data, such as type of lead agency in the state and location of the workshop.

Additional information about the workshops in grantees' administrative data was included in the regression analysis to examine whether these features might also be related to completion rates. This includes whether the grantee was a department of aging or public health (both were eligible to apply as grantees); whether an optional introductory "class zero" was offered to give participants an idea of the workshop format;\* metro/nonmetro location, given known transportation challenges in rural areas; and time of year the workshop was scheduled to account for weather and transportation as possible barriers to attendance.

After removing observations with missing data (for participants or implementation sites), our data contain 55 803 participants and 5505 workshops in CDSMP and 8242 participants and 815 workshops in DSMP. We conducted 3 regressions: (1) pooled CDSMP and DSMP; (2) only CDSMP; and (3) only DSMP. The pooled regressions show "average" impact of each explanatory variable

\*A workshop site can hold an "orientation" class/session (prior to the 6 actual sessions) to explain class activities, provide an overview of the workshop, and collect baseline data.

**Table 5.** Participants and Completion Rates in CDSMP and DSMP

Workshops	All		Diabetic Persons	
	Participants	Completion, %	Participants, %	Completion, %
CDSMP				
7,749	89,861	74.5	23,579	77.2
DSMP				
1,119	12,533	77.9	8,311	80.7

Abbreviations: CDSMP, Chronic Disease Self-Management Program; DSMP, Diabetes Self-Management Program.

without distinguishing between CDSMP and DSMP workshops except for a dummy variable to allow for differences between the 2. The 2 remaining regressions use subsets of CDSMP or DSMP data completely independently.\* The results in Table 6 provide odds ratios from the logistic regressions. The columns labeled models 1 to 3 present findings for pooled, CDSMP only, and DSMP only regressions. We summarized the findings by participant demographic characteristics and workshop characteristics.

### PARTICIPANT DEMOGRAPHIC CHARACTERISTICS

The results show that the odds of completion for female participants were about 9% higher than for male participants in CDSMP and 14% higher in DSMP (with an average of 10% in model 1). With respect to race, Native Hawaiian/Pacific Islanders were the smallest group (<1% of CDSMP participants) but had the highest odds of completion in CDSMP (4 times more likely than whites).

\*A coefficient estimate (in odds ratio form) that is greater (less) than 1 indicates that variable increases (decreases) the odds of a participant completing the program. For example, an odds ratio of 1.25 indicates that the odds of a participant completing the program are 25% higher for a 1-unit increase in the predictor variable. On the contrary, an odds ratio of 0.9 indicates that the odds of a participant completing the program are 10% lower for a 1-unit increase in the predictor variable.

African Americans were 15% more likely to complete CDSMP than whites, but significant differences did not appear in DSMP between the 2 races. Asian/Asian Americans made up of less than 5% of the participants but were 96% more likely to complete DSMP than whites. There are no significant differences in CDSMP between the 2 races. With respect to ethnicity, there are no significant differences between participants who are Hispanic and not Hispanic in CDSMP, but the odds of completion for Hispanics are 33% lower than for not Hispanics in DSMP. Additional research is needed to help explain this finding.

The data do show significant differences between participants of different age groups. The odds of completion for age groups 60 to 84 years are significantly higher than for the participants in the 85+ and under 60 years age groups, but the impact in DSMP is higher than in CDSMP. Specifically, the odds of completion in both CDSMP and DSMP for the 65 to 74 years age group are the highest among all age groups, whereas the odds of completion are lowest for the under 60 and 85+ years age groups (odds of completion are 18% and 48% higher in CDSMP and DSMP, respectively, for 65 to 74 years age group compared with the under 60 years age group).

### HEALTH STATUS

We also considered the effect of chronic conditions reported by participants on

**Table 6.** Logit Regression Results—Completion Rates

	Pooled (1)	CDSMP (2)	DSMP (3)
<b>Dependent Variable: Completion</b>			
DSMP	1.007		
Male			
Female	1.100 <sup>a</sup>	1.094 <sup>a</sup>	1.143 <sup>b</sup>
White			
African American	1.148 <sup>a</sup>	1.152 <sup>a</sup>	1.110
American Indian/Alaskan	0.919	0.947	0.668
Asian/Asian American	1.013	0.963	1.958 <sup>c</sup>
Native Hawaiian/Pacific Islander	3.582 <sup>a</sup>	4.039 <sup>a</sup>	1.064
Multiracial/other	1.047	1.122 <sup>b</sup>	0.805 <sup>b</sup>
Not Hispanic or Latino			
Hispanic or Latino	0.889 <sup>c</sup>	0.952	0.676 <sup>a</sup>
Age <60 y			
Age 60-64 y	1.165 <sup>a</sup>	1.149 <sup>a</sup>	1.276 <sup>c</sup>
Age 65-74 y	1.220 <sup>a</sup>	1.182 <sup>a</sup>	1.479 <sup>a</sup>
Age 75-84 y	1.152 <sup>a</sup>	1.132 <sup>a</sup>	1.263 <sup>c</sup>
Age 85+	0.946	0.932	0.978
No conditions			
Arthritis	1.015	1.026	0.955
Cancer	1.032	1.035	1.000
Depression	0.831 <sup>a</sup>	0.833 <sup>a</sup>	0.815 <sup>c</sup>
Diabetes	1.011	0.988	1.145 <sup>b</sup>
Heart disease	0.989	1.010	0.882
Hypertension	1.081 <sup>a</sup>	1.102 <sup>a</sup>	0.971
Lung disease	0.971	0.980	0.904
Stroke	0.964	0.982	0.883
Other chronic disease	1.023	1.023	1.062
Osteoporosis	1.061 <sup>b</sup>	1.075 <sup>b</sup>	0.964
Multiple chronic diseases	1.045	1.041	1.051
Site: Residential facility			
Site: Senior center	1.372 <sup>a</sup>	1.372 <sup>a</sup>	1.347 <sup>a</sup>
Site: Health care organization	1.149 <sup>a</sup>	1.125 <sup>a</sup>	1.361 <sup>c</sup>
Site: Faith-based organization	1.522 <sup>a</sup>	1.629 <sup>a</sup>	0.940
Site: Area agency on aging	1.477 <sup>a</sup>	1.472 <sup>a</sup>	1.470 <sup>b</sup>
Site: Other	1.509 <sup>a</sup>	1.480 <sup>a</sup>	1.670 <sup>a</sup>
Site in nonmetro area			
Site in metro area	0.912 <sup>a</sup>	0.904 <sup>a</sup>	1.009
Class 0 not offered			
Class 0 offered	1.124 <sup>a</sup>	1.080 <sup>c</sup>	1.426 <sup>a</sup>
11-16 participants			
<6 participants	1.624 <sup>a</sup>	1.540 <sup>a</sup>	2.368 <sup>a</sup>
6-10 participants	1.047	1.029	1.189 <sup>c</sup>
17-20 participants	0.960	0.956	1.000
>20 participants	0.499 <sup>c</sup>	0.503 <sup>c</sup>	

*(continues)*

**Table 6.** Logit Regression Results—Completion Rates (*Continued*)

	Pooled (1)	CDSMP (2)	DSMP (3)
English workshop			
Spanish workshop	1.602 <sup>a</sup>	1.475 <sup>a</sup>	2.062 <sup>a</sup>
Lead agency: Aging			
Lead agency: Public health	0.871 <sup>a</sup>	0.871 <sup>a</sup>	0.877
Workshop in January-March			
Workshop in April-June	1.037	1.060 <sup>b</sup>	0.839 <sup>b</sup>
Workshop in July-September	1.023	1.035	0.934
Workshop in October-December	0.893 <sup>a</sup>	0.906 <sup>a</sup>	0.795 <sup>c</sup>
N	64,045	55,803	8,242

Abbreviations: CDSMP, Chronic Disease Self-Management Program; DSMP, Diabetes Self-Management Program.

<sup>a</sup>0.1% significance level.

<sup>b</sup>5% significance level.

<sup>c</sup>1% significance level.

workshop completion rates. Among the list of 10 possible chronic conditions, depression significantly lowers the odds of completion in both CDSMP and DSMP. The odds of completion for participants who report depression are approximately 16% to 19% lower than for participants who do not report depression in both programs. Also, the odds of completion increase for participants with hypertension (10%) and osteoporosis (7.5%) for CDSMP compared with participants who do not report any chronic conditions (see “Discussion”). Interestingly, the odds of completion increase for participants with diabetes in DSMP (15%), but the differences are insignificant in CDSMP. Finally, the presence of other chronic conditions does not significantly affect the odds of completion in either of the programs. After controlling for individual chronic conditions, the effect of having multiple chronic conditions on completion is insignificant for both programs.

### WORKSHOP SITE AND CHARACTERISTICS

We examined the effects of type and location of the workshop site, whether the work-

shop included an introductory class zero, and the number of workshop participants, and our findings confirm that the type of workshop site affects the odds of completion. These findings are consistent with previous analyses, suggesting that the site where workshops are offered may be associated with completion, and that participant groups varied in their preferences to enroll in workshops depending on where they were offered. Using residential facilities as the comparison group (or excluded type in the regressions), we found that completion rates are the lowest in residential facilities for CDSMP and in residential facilities and faith-based organizations for DSMP, and completion rates are the highest among faith-based organizations (63%) in CDSMP and area agencies on aging (47%) in DSMP (excluding the “other” types of sites).<sup>\*</sup> Interestingly, faith-based organizations had the lowest completion rates (with

<sup>\*</sup>Remaining types of organizations that were grouped together under an “other” category were county health departments, educational institutions, libraries, multipurpose social services organizations, recreational organizations, tribal centers, workplaces, and other unspecified locations.

residential facilities) in DSMP, although faith-based organizations had the highest completion rates in CDSMP.

The results of model 2 show that the odds of completion at sites in metro areas are about 9% lower than in nonmetro areas for CDSMP. In model 3, we found no significant differences between any of the type of location in DSMP. Interestingly, the odds of completion in workshops that offered class zero, which is designed to improve recruitment into the workshop rather than completion, are about 8% and 43% higher for CDSMP and DSMP, respectively, than in workshops that did not offer class zero.

To investigate the influence of workshop size (defined as the number of participants) on likelihood of completion, we created 5 size categories: (1) less than 6 participants, (2) 6 to 10 participants, (3) 11 to 16 participants, (4) 17 to 20 participants, and (5) 21 participants or more. We analyzed the effect of workshop size using the “11 to 16 participants” category as the comparison group, averaging the 10 to 16 “ideal” class size for CDSMP and the 12 to 16 “ideal” class size for DSMP recommended by Stanford program developers. The smallest workshops for both CDSMP and DSMP had the highest completion rates: The odds of completion in workshops with less than 6 participants were about 54% and 137% higher in CDSMP and DSMP, respectively, than in workshops with 11 to 16 participants. Our findings indicate that the odds of completion in DSMP workshops with 6 to 10 participants are about 19% higher than in workshops with 11 to 16 participants. However, there are no significant differences between workshops with 6 to 10 participants and 11 to 16 participants for CDSMP. Finally, the likelihood of completion drops significantly (about 50%) in CDSMP workshops with more than 20 participants. There are no DSMP workshops with more than 20 participants.

Finally, our analyses showed that the odds of completion are significantly higher in Spanish CDSMP (*Tomando Control de su Salud*) and DSMP (*Tomando Control de su Diabetes*) workshops than in English lan-

guage workshops with larger differences for DSMP.

## GRANTEE CHARACTERISTICS

Both aging and public health agencies were eligible to serve as lead agency for the ACL/AoA grant awards. The completion rates were 13% lower in CDSMP when the recipient of grants was a public health agency, but there were no significant differences between the 2 for DSMP. However, it is important to note that this may not be a reflection on the grantee type, rather it may reflect a different program or population focus depending on lead agency. But, because both types of agencies were involved in each grant, more research is needed to understand this difference.

## TIMING OF WORKSHOPS

The likelihood of workshop completion is significantly lower for workshops offered during October-December period (possibly due to holidays) for both CDSMP and DSMP than for workshops offered during January-March period. Finally, we found that the CDSMP workshops offered in April-June period have higher completion rates than in January-March period, but the opposite is true for DSMP.

## DISCUSSION

While individuals with diabetes participated in both CDSMP and DSMP, completion rates were higher than average for participants with diabetes in both programs (77.2% for individuals with diabetes in CDSMP vs 74.5% for all participants, and 80.7% for individuals with diabetes in DSMP vs 77.9% for all participants). Our analyses also confirm the study hypothesis that completion rates would likely be higher for individuals with diabetes who participated in DSMP than in CDSMP, given the specific focus on diabetes offered in DSMP.

Individuals with diabetes accounted for a substantial portion of workshop participants in both CDSMP and DSMP, with 26.2% of

CDSMP participants and 66.3% of DSMP participants reporting a diabetes diagnosis. As we noted previously, it is interesting that one-third (33.7%) of DSMP participants did not self-report as individuals with diabetes, suggesting that many DSMP participants were likely prediabetic or nondiabetic caregivers of people with diabetes (see caveats below regarding participation by caregivers of individuals with chronic diseases in CDSMP and DSMP).

Consistent with findings in other studies, females were more likely than males to participate in and complete either CDSMP or DSMP. However, males with diabetes accounted for a higher percentage of diabetic participants than males among nondiabetic participants (but reporting other chronic conditions). The proportions of African Americans and Hispanics, groups disproportionately affected by diabetes, were higher in DSMP than in CDSMP. It may be that community members are more aware of the importance of managing their diabetes given its relatively high prevalence, or that grantees and workshop sites targeted outreach to these populations with a focus on diabetes self-management. Notably, once enrolled as participants, African Americans had impressive completion rates, above those reported for whites in CDSMP, but the results are inconclusive in DSMP. With respect to the completion rates of Hispanics, we get mixed results for both CDSMP and DSMP because of data limitations. Furthermore, whites who self-reported a diagnosis of diabetes were more likely to participate in CDSMP than in DSMP. These findings may reflect availability of each workshop type, participant preferences, or targeted outreach. Further research is needed outside the Communities Putting Prevention to Work initiative to better understand the meaning of these results.

Most participants, including individuals with and without diabetes, reported multiple chronic conditions. Our findings showed higher prevalence of chronic conditions among CDSMP participants in both diabetic and nondiabetic subpopulations (although the opposite is true in the aggregate) than

among DSMP participants. With the exception of diabetes in DSMP, hypertension was the most common chronic condition in both workshops, followed by arthritis. For both groups, a diagnosis of depression, not surprisingly, was associated with significantly lower completion rates, with a slightly larger effect for CDSMP.

The likelihood of completion was also associated with participant's age, with odds of completion highest for the 65- to 74-year-old group and lowest for individuals younger than 60 years and those aged 85 years and older. Results are similar for CDSMP and DSMP. We also found that Hispanics were less likely to complete DSMP than non-Hispanics. The reasons for this are not clear. Additional research is needed to help explain this finding.

Workshop setting was related to completion. Diabetes Self-Management Program was most likely to be offered in senior centers, while CDSMP was most likely to be offered in health care organizations and senior centers (excluding all "other" settings such as county health departments, educational institutions, libraries, multipurpose social services organizations, and other unspecified locations). Residential facilities had the lowest completion rates for both CDSMP and DSMP. Faith-based organizations had similar completion rates as residential facilities for DSMP but had the highest completion rates for CDSMP. Completion rates were also higher when the grantee was a department of aging than a department of public health.

It is important to note several caveats in considering these results. Our findings are observational, based on program administrative data from the Communities Putting Prevention to Work initiative, and may be limited in generalizability to other initiatives and settings. We should remind that the 2 groups of participants analyzed—CDSMP and DSMP—were not randomly assigned to 1 of the workshops. Implementing sites use different recruiting methods and channels, and participants choose to attend whichever workshop they think will be best for their health status. In some cases, it could be the case that only 1

of CDSMP or DSMP was available in a particular geographic area.

As we have stated previously, it is not possible to attribute causality in this study, given limitations of the data. Also, we are not able to examine changes in self-management behaviors or health outcomes, ability to get people to attend a program at all (eg, recruitment success), and quality and success of the workshop, as such information was not collected and monitored. Finally, both programs are open to caregivers, which inadvertently would affect our estimates. Unfortunately, our data do not allow us to distinguish caregivers from other participants.

Considering that these programs are designed for individuals with chronic diseases, it could be argued that the focus of the analyses should be participants with chronic diseases. Also, participants with no chronic diseases might be more likely to be caregivers of other individuals. To address these concerns, we reestimated our model by excluding participants who did not report any chronic condition and found that having diabetes or not did not have a significant effect on the likelihood of completion in either of the 2 programs compared with participants with other chronic diseases. We believe

that this issue requires more detailed data collection and further investigation in future studies.

## CONCLUSION

Our findings show that grantees have successfully delivered community-based diabetes self-management education to diverse populations, including minority populations that experience higher than average prevalence of this potentially disabling and costly condition. Diabetes Self-Management Program appears to have been particularly successful, resulting in higher completion rates for diabetic populations. While more research is needed on the comparative effectiveness of CDSMP and DSMP for older adults with diabetes, our findings demonstrate that evidence-based diabetes self-management education provided in small groups through these programs can be brought to scale, achieving impressive completion rates for minority populations and others highly affected by diabetes type 2. Diabetes Self-Management Program, in particular, achieved high completion rates for participants and is a viable tool to help stem the impact of diabetes and its prediabetic conditions.

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