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Changes in Quality of Life Indicators among Chronic Disease Self-Management Program Participants: An Examination by Race and Ethnicity

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Objective: To assess changes in self-reported quality of life indicators among Chronic Disease Self-Management Program (CDSMP) participants from baseline to 6-month follow-up and compare observed changes by racial and ethnic group.

Design: A pre-post evaluation design was employed for this evidence-based chronic disease self-management intervention. Data were collected at baseline and again six months post intervention.

Setting: Using the aging services network and public health system, workshops were hosted in a variety of community settings including senior centers, churches, libraries, and health care settings.

Participants: One-hundred thirty-six adults aged ≥50 years residing in Bexar County, Texas.

Interventions: CDSMP is an evidence-based program created at Stanford University. The program was held one time per week for six consecutive weeks. Each session lasted approximately 150 minutes.

Main Outcome Measures: Health-related quality of life indicators developed by the Centers for Disease Control and Prevention (ie, total number of unhealthy physical days, unhealthy mental days).

Results: From baseline to 6-month follow-up, significant differences by racial/ethnic group were observed for changes in unhealthy physical days and changes in combined unhealthy days. Hispanic participants showed greatest improvement, followed by African American participants, followed by non-Hispanic White participants.

Conclusions: Findings indicate health-related quality of life improvements can be sustained months after the conclusion of CDSMP. Given gains seen among minority participants and forthcoming demographic shifts in this Texas region, community-driven interventions should be expanded as part of broader efforts to reduce racial and ethnic disparities in health. (*Ethn Dis.* 2013;23[2]:182–188)

Key Words: Program Evaluation, Quality of Life, Self-management, Older Adults, Aging

Introduction

Pronounced demographic shifts among the aging population will be accompanied by a substantial rise in morbidity and mortality associated with obesity, heart disease, and diabetes.[1] The development and exacerbation of such chronic diseases are attributed, in large part, to major public health problems that include having no usual source or access to clinical preventive care, limited preferences for or access to healthy food choices, and residing within built environments that hinder opportunities to engage in active lifestyle behaviors.[2] These and other related modifiable health determinants deleteriously affect health outcomes that contribute to some of the leading causes of death in the United States and claim the lives of 1.7 million Americans each year.[3]

The elevated risk for premature disability and death as a result of chronic disease and its related complications is especially prevalent among racial and ethnic minority groups.[4–6] Such disparities are due to an etiological complexity that reflects the interaction of genetic susceptibility, lifestyle characteristics, and socioeconomic conditions.[7] Racial and ethnic minority groups are often characterized by disproportionately lower rates of education and employment (ie, more likely to be unemployed or more likely to be employed in high-risk occupations) live in poverty, rate their health as poor, have limited to non-existent health insurance coverage and lack access to a health care system.[8–10]

In Bexar County, Texas, approximately 57% of the 1.6 million residents are of Hispanic-origin (80% of which are of Mexican descent).[11] Compared to the remainder of Texas, socioeconomic and health disadvantage is especially pronounced in this county where almost one in five residents (17%) live at or below the poverty level with a per capita annual income of $22,557.[11] Behavioral risk for disease and corresponding health outcomes are similarly elevated (eg, 49% of adults report no form of leisure activity and 68% are either

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overweight or obese).[12] The diabetes incidence in Bexar County is twice that of the national average (ie, 14%) and this community has a higher age-adjusted heart disease mortality rate compared to the rest of the South Texas region (251.1 per 100,000 vs 225.7 per 100,000, respectively).[13–16] The health status of these Texas residents demonstrate the need to design and implement community-based interventions that promote a healthy lifestyle balance to reduce the risk factors associated with chronic disease.

The Department of Aging and Disability Services and Department of State Health Services has supported the implementation of evidence-based programs to seniors in Texas through Texas Healthy Lifestyles since 2006.[17] Working collaboratively, the Bexar Area Agency on Aging (BAAA) and Texas A&M Health Science Center School of Rural Public Health Program on Healthy Aging have delivered evidence-based programs including Chronic Disease Self-Management (CDSMP), A Matter of Balance/Volunteer Lay Leader Model (AMOB/VLL), and EnhanceFitness. The Texas Healthy Lifestyles initiative is designed to: 1) evaluate evidence-based health promotion programs implemented in three counties with the goal of expanding delivery statewide; 2) reduce chronic disease burden across regions of Texas that offer evidence-based programs by enhancing older adults' self-management skills; 3) increase awareness about existing local resources to facilitate healthier-lifestyles among older adults; and 4) foster partnerships with other states and national stakeholders to advance the science base related to evidence-based health promotion.[17]

Building on previous work that has highlighted other aspects of delivering evidence-based programs throughout Texas, such as recruitment strategies and implementation practices,[18–20] in our study, we focus on documenting outcomes associated with the delivery of the

Our two study objectives were to: 1) assess changes in self-reported quality of life indicators among CDSMP participants from baseline to 6-month follow-up; and 2) compare these changes by racial and ethnic group.

Stanford CDSMP in Bexar County, Texas. While an array of studies have been conducted that examine the influence of CDSMP on health indicators among older adults, the public health measures of quality of life endorsed by the Centers for Disease Control and Prevention have not typically been included in prior research with specific attention to examining racial and ethnic differences. Therefore, our two study objectives were to: 1) assess changes in self-reported quality of life indicators among CDSMP participants from baseline to 6-month follow-up; and 2) compare these changes by racial and ethnic group.

METHODS

Participants and Procedures

The Chronic Disease Self-Management Program is an evidence-based program open to adults with different types of chronic conditions and facilitated by two trained lay leaders (ie, ideal classes have at least one of the leaders be a non-health professional with a chronic disease). The program is held one time per week for six consecutive weeks; each session lasts approximately 150 minutes. In community settings, CDSMP fidelity has been maintained using the standards and curriculum guidelines recommended by the original program developers at Stanford University.[21] Previous studies

from the original randomized research studies have demonstrated the effectiveness of CDSMP to improve physical activity, cognitive symptom management, communication with physicians, self-reported health, health distress, fatigue, disability, and social/role activities limitations in participants.[22]

Participants were recruited into CDSMP workshops through the Texas Healthy Lifestyles initiative on an ongoing basis from June 2007 to March 2010.[19] To enroll participants in the program, recruitment efforts of the BAAA utilized a variety of community partners who provided programs and services for older adults. Strategies employed to recruit participants included developing partnerships among agencies within the aging services network and public health system to host workshops in a variety of community settings such as senior centers, churches, libraries, and healthcare settings. These agencies were targeted for program adoption because CDSMP was a naturally-fitting program to be embedded within their existing service offerings and because they already served older adults with chronic conditions.

All data collected from participants were obtained using self-report, paper-pencil questionnaires. Baseline data were collected at an orientation class (class session zero) prior to the first workshop, with post-assessments collected six months from the conclusion of session one. Six-month post-assessments were obtained through reunion meetings held at original implementation sites. Data utilized in this study were collected from a subset of the 52 CDSMP workshops conducted in Bexar County, Texas during this time frame. It is important to note that CDSMP workshops were also delivered outside this initiative by other providers (eg, health care systems), however, our study utilized only participants who enrolled in workshops affiliated with the Texas Healthy Lifestyles Initiative in which pre-and post-assessments were collected.

Measures

Utilizing data collected from baseline and post-assessment questionnaires, we tested three types of measures in our study: participant sociodemographics, program participation, and health status indicators. Participant sociodemographics used in our study included, age, sex, race/ethnicity, education, and marital status. Program participation was assessed from participants' session attendance obtained from administrative records (ranging from 1 to 6 sessions). Health status indicators included the number of self-reported chronic conditions (ranging from 0 to 7) and health-related quality of life (HRQOL) indicators. For the purpose of our study, the authors chose two HRQOL items developed by the Centers for Disease Control and Prevention and extensively utilized in public health research.[23,24] The items asked participants to rate aspects of their physical health (ie, total number of unhealthy physical days) and mental health (ie, total number of unhealthy mental days) within a one-month timeframe. Both items were open-ended with possible scores ranging from 0 to 30 days. In addition to using these items independently, we also created a summary score (ie, combined unhealthy days) by summing responses from both items and restricting the resulting scores within the range of 0 to 30 days (ie, scores greater than 30 were recoded to equal 30). Change scores from baseline to post-assessment were also created for the number of unhealthy mental days, number of unhealthy physical days, and the summary score. The change score values are reported for the entire sample and separately by racial/ethnic group.

Data Analyses

The original sampling frame included 503 participants enrolled in CDSMP in Bexar County, however, those who did not complete both the baseline and post-assessment were omitted from analyses (n=358). Additionally, participants who aged <50 years (n=2) and self-identified as a race/ethnicity other than non-Hispanic white, African American, or Hispanic (n=7) were excluded. The final analytic sample contained 136 CDSMP participants. Pearson's Chi-squared tests were performed to identify the frequency distribution variation for study variables across racial/ethnic groups. Analysis of variance (ANOVA) was used to compare mean differences across groups for continuous variables. As an indicator of practical significance, Cohen's d standardized effect sizes were calculated to compare the intervention effects from baseline to post-assessment within each racial/ethnic group. The HRQOL scores were tested from baseline to post-assessment. Additionally, post-assessment scores were subtracted from baseline scores to create a change score for unhealthy physical days, unhealthy mental days, and combined unhealthy days. Analysis of variance and post-hoc tests using Tukey's procedures were computed to compare the mean differences from baseline to post-assessment between the three different groups. Statistical significance for these analyses was determined using the criterion of P<.05.

RESULTS

Approximately 500 adults residing in the San Antonio area enrolled in the CDSMP delivered as part of the Texas Healthy Lifestyles initiative.[19] Although a Spanish-language version of CDSMP is available, the vast majority of participants enrolled in the English language version (95%). To identify potential sample biases, analyses were performed to compare characteristics of study participants and those excluded from the study using the criteria mentioned above. Compared to those excluded from the study, study participants were similar with regards to sex, marital status, and the average number of reported chronic conditions. However, a significantly larger proportion of study participants had graduated high school (X^2 = 12.77, P=.002) and were Hispanic (X^2=35.97, P<.001).

Descriptions of study participants are summarized in Table 1. Approximately 54% self-identified as non-Hispanic White (n=73), 32% Hispanic (n=43), and 14% African American (n=20). The mean age of participants was 73.2 years (SD=8.62). The majority of participants were female (86.0%), unmarried (ie, single, widowed, or separated) (61.0%), and had more than a high school education (71.6%). On average, participants attended 5.35 (SD=1.27) of the six CDSMP Workshop sessions, with 80% considered to be "successful completers" (ie, attending four or more sessions). Participants experienced multiple co-morbidities with participants self-reported having an average of 2.44 (SD=1.39) chronic conditions. When comparing these characteristics by ethnicity, Hispanic participants were younger, on average, than their African American and non-Hispanic white counterparts (f=3.74, P=.026). A significantly larger proportion of Hispanic and African American participants were female (X^2 =8.83, P=.012), unmarried (X^2 = 10.26, P=.006) and had less than a high school education (X^2 = 24.44, P<.001) compared to their non-Hispanic white counterparts.

Table 2 provides detailed descriptions of HRQOL scores at baseline and post-assessment (n=84 matched cases). Significant differences by racial/ethnic group were observed for changes in unhealthy physical days and changes in combined unhealthy days. On average, Hispanic participants reported the most improvement in unhealthy physical days (5.14 ± 9.96), followed by African Americans (2.38 ± 10.18), then non-Hispanic Whites (−.91 ± 7.27) [f = 3.31, P=.042]. On average, Hispanic participants reported the

Table 1. Participant characteristics by race/ethnicity category[a]

	Non-Hispanic White (n=73)	African American (n=20)	Hispanic (n=43)	Total (n=136)	χ^2 or f	P
Age	74.00 (±9.20)	76.35 (±9.06)	70.60 (±6.65)	73.27 (±8.62)	3.74	.026
Sex					8.83	.012
Male	16 (21.9%)	0 (0.0%)	3 (7.0%)	19 (14.0%)		
Female	57 (78.1%)	20 (100.0%)	40 (93.0%)	117 (86.0%)		
Education levels					24.44	<.001
Less than high school	1 (1.5%)	6 (30.0%)	4 (23.5%)	11 (10.8%)		
High school graduate	10 (15.4%)	7 (35.0%)	1 (5.9%)	18 (17.6%)		
More than high school	54 (83.1%)	7 (35.0%)	12 (70.6%)	73 (71.6%)		
Marital status					10.26	.006
Married	34 (51.5%)	3 (15.8%)	11 (28.9%)	48 (39.0%)		
Not married	32 (48.5%)	16 (84.2%)	27 (71.1%)	75 (61.0%)		
Number of chronic conditions	2.56 (±1.54)	2.32 (±1.06)	2.30 (±1.28)	2.44 (±1.39)	1.03	.591
Number of session attended	5.26 (±1.19)	4.70 (±1.84)	5.35 (±1.02)	5.35 (±1.27)	1.97	.144

[a] Means (±SD) and F-statistics reported for continuous variables.

most improvement in combined unhealthy days (7.00 ± 10.41) followed by African Americans (2.94 ± 9.92), then non-Hispanic Whites (.18 ± 7.65) [f = 3.661, P=.030]. Post-hoc analyses using Tukey's procedures revealed that significant differences in mean scores between racial/ethnic groups for unhealthy physical days and combined unhealthy days were attributed to differences between scores of Hispanic participants and non-Hispanic Whites. Despite the absence of significant changes from baseline to post-assessment for Hispanic participants, large standardized Cohen's d effect sizes indicate intervention effects were observed for unhealthy physical days (Cohen's d=.66) and combined unhealthy days (Cohen's d=.76). These measures of practical significance were larger than those of their counterparts in other racial/ethnic groups.

DISCUSSION

The purpose of our study was to examine effects on quality of life indicators associated with enrollment in an evidence-based Chronic Disease Self-Management Program in Bexar

Table 2. Health indicator variables by race/ethnicity[a]

	Non-Hispanic White (n= 54)	African American (n= 16)	Hispanic (n=14)	Total (n=84)	f	P
Unhealthy Physical Days						
Baseline	4.57 (±7.34)	7.69 (±11.11)	8.36 (±10.17)	5.80 (±8.70)	1.54	.221
Post Assessment	5.48 (±8.98)	5.31 (±7.88)	3.21 (±4.26)	5.07 (±8.14)	.43	.649
Cohen's d	−.11	.25	.66	.09		
Change Score	−.91 (±7.27)	2.38 (±10.18)	5.14 (±9.96)	.73 (±8.58)	3.31	.042
Unhealthy Mental Days						
Baseline	4.52 (±9.04)	6.56 (±9.08)	3.57 (±5.26)	4.75 (±8.50)	.51	.601
Post Assessment	3.15 (±6.74)	4.56 (±6.54)	1.36 (±2.31)	3.12 (±6.20)	1.00	.373
Cohen's d	.18	.25	.54	.22		
Change Score	1.37 (±6.27)	2.00 (±6.31)	2.21 (±4.93)	1.63 (±6.02)	.14	.867
Combined Unhealthy Days						
Baseline	7.61 (±10.01)	11.56 (±13.16)	11.57 (±12.18)	9.02 (±11.05)	1.24	.294
Post Assessment	7.43 (±9.73)	8.62 (±10.23)	4.57 (±4.77)	7.18 (±9.19)	.78	.464
Cohen's d	.02	.25	.76	.18		
Change Score	.18 (±7.65)	2.94 (±9.92)	7.00 (±10.41)	1.84 (±8.86)	3.66	.030

[a] Means (±SD) and F-statistics reported for continuous variables.

The greatest reductions in unhealthy days were seen among racial/ethnic minority participants, especially among Hispanic individuals compared to their non-Hispanic White counterparts.

County, Texas and to explore differences in observed effects among three racial/ethnic groups. The primary findings of our study revealed, on average for all participants, there were improvements in self-reported unhealthy physical days and combined unhealthy days over a 6-month period. However, the greatest reductions in unhealthy days were seen among racial/ethnic minority participants, especially among Hispanic individuals (ie, compared to their non-Hispanic White counterparts). These findings highlight the sustainability of health-related quality of life improvements months after the program has been completed similar to prior studies documenting other positive outcomes,[22] and point to the value of investigating program-related benefits among more diverse groups of participants than typically seen in health promotion or self-management studies.[25–27] Although these preliminary findings are very promising regarding the short-term benefits of CDSMP type programs in all racial/ethnic groups, additional studies are needed to investigate the nature, extent, and correlates associated with the longer-term sustainability of such benefits.[28]

Self-reported quality of life has been associated with better health outcomes, overall well-being, and increased longevity.[23,29–35] Thus, our study reflects an important investigation of the ability for CDSMP to foster improvements in perceived quality of life, which supports the need for widespread dissemination of the program to reach more diverse and vulnerable populations. Although it is well-known that racial/ethnic minority groups encounter higher rates of chronic diseases like hypertension and diabetes,[34,36–38] more research is needed among these subgroups in various community-based settings to determine the effectiveness of CDSMP to assist participants self-manage their conditions and reduce disparities attributed to healthcare utilization and disease-related complications and mortality.[19] For this reason, it is encouraging that Hispanic participants reported the greatest rates of quality of life improvement, despite being faced with greater risk factors for chronic disease and associated difficulties. Further studies are needed to track larger groups of Hispanic and African American CDSMP participants over time to determine if the program reduces disparities in population health outcomes such as health care utilization as well as morbidity outcomes such as disability free life years.

Interestingly, this initiative to disseminate CDSMP within a minority-majority community revealed a noteworthy artifact. Despite being offered in Spanish, the vast majority of participants (95%) enrolled in CDSMP workshops delivered in English. In line with our anecdotal evidence that bilingual (Spanish-English) US residents prefer obtaining medical information from physicians in English, this community-based program administration may indicate Hispanic participants consider CDSMP to be similar to medical information. While Spanish-speaking adults may be more likely to prefer Spanish-speaking physicians, these individuals are more likely to be uninsured and of lower socioeconomic status.[39] Therefore, this programmatic tidbit may indicate that language-based barriers may not be as pronounced in our study because participants in this sample had higher levels of education than typically seen in health disparities research studies.[40–42] It may also be that Hispanic individuals attending these classes were more language acculturated than participants in previously documented studies such as those conducted at the Texas–Mexico border.[43] Nonetheless, cultural tailoring is still necessary when delivering programs intended to modify aspects of nutrition and/or physical activity among racially/ethnically diverse participants (eg, culturally appropriate foods and methods of meal preparation).[44] As CDSMP continues to be offered in Spanish, additional research is needed to investigate the factors associated with Hispanic adults enrolling in Spanish-led CDSMP workshops.

While the theoretical mechanisms underlying these study findings are unclear and need to be examined in future research, it may be that the Hispanic attendees bonded more with their lay leaders and other participants, which resulted in more positive quality of life outcomes. This favorable Hispanic bias is consistent with a meta-analysis of CDSMP studies, which concluded Hispanic participants exhibit better outcomes when enrolled in CDSMP and related programs relative to their non-Hispanic White counterparts.[45]

There were limitations associated with our study. First, our study focused on the delivery of CDSMP in one Texas County and contained a modest sample size, which may limit the ability of our findings to be generalized beyond these study participants. The sample size was influenced by the difficulties of tracking participants over a 6-month period, a challenge typically expressed by community-based intervention deliverers attempting to monitor participants with limited resources. Despite this attrition, our analyses were able to detect quality of life improvements based on race/ethnicity. Second, complete data at baseline and post-assessment were required for inclusion in this study. This fidelity-related issue, as well as other

training and implementation issues noted in the Stanford CDSMP manual, were not examined in this study and may have been inconsistently distributed across workshops. Therefore, the relative importance of various fidelity-related components on CDSMP outcomes is unknown and requires further investigation. Third, all data (including quality of life indicators) were self-reported, which may have introduced bias. Fourth, although Hispanic participants showed the greatest improvements in quality of life indicators relative to their African American and non-Hispanic White counterparts, they also enrolled in the program with the most self-reported unhealthy physical days and combined unhealthy days at baseline. Thus, rates of improvement among this subgroup relative to non-Hispanic Whites may be attributed to a 'ceiling effect' or regression to the mean.

Findings of our study help demonstrate the value of implementing chronic disease self-management programming for improving health outcomes in populations with disproportionately higher rates of chronic disease. In particular, improvements reported among Hispanic participants' quality of life reinforce the importance of expanding efforts to implement risk-reducing health interventions in economically vulnerable communities where sociodemographics illustrate the interplay deleterious effects economic vulnerability can have on individual health. It is projected that in Bexar County alone the obesity rate among residents is projected to increase by 91% by the year 2040,[12] and the Hispanic population is estimated to grow by 32% in the same time frame. Given these forthcoming shifts in at-risk populations in this region, community-driven interventions such as CDSMP should continue to be expanded as part of a broader effort to reduce racial and ethnic disparities in health.

To maximize health-related impact, CDSMP can be delivered within a gamut of other evidence-based disease prevention programs (eg, AMOB/VLL, EnhanceFitness) to extend services to participants over larger geographic regions by integrating the public health system and aging services network. Although, to be effective in reaching participants who may be challenged with issues surrounding mobility or transportation, these programs must be adopted by community-, faith-, and government-based organizations in which people naturally congregate, close to participants' homes. With a new federal emphasis on disseminating CDSMPs throughout the nation to seniors, the Texas Department of Aging and Disability Services has pledged that almost 3,000 older adults will successfully complete CDSMPs under American Recovery and Reinvestment Act funding from 2010–2012. The widespread dissemination of CDSMPs aligns with the Affordable Care Act's emphasis on patient-centered care and better integration across care settings.[46] This will require stronger links between primary care and public health sectors to ensure health care providers are aware of the benefits of evidence-based CDSMPs, especially for those from racial and ethnic backgrounds, know where such programs are being offered in the community, and seek feedback about their patient's successes and challenges in managing their chronic conditions on a day-to-day basis.

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Data analysis and interpretation: Smith, Cho, Salazar, Ory
Manuscript draft: Smith, Cho, Ory
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