Chronic Disease Self Management Program (CDSMP) Impacts Perceived Health Status For Underserved Rural Clients

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Abstract

Background: Despite growing recognition that chronic disease management is a vital health care issue, success in the management of chronic disease has been limited. Switching from palliative medical model to a participatory and prevention-based approach may provide a roadmap to meet today's health care challenges.

Purpose: To determine whether participation in the Chronic Disease Self Management Program (CDSMP) significantly improved underserved rural participant's outcomes.

Methods: A quasi-experimental pre-test, post-test design the intervention was tested with a convenience sample of 48 rural, underserved, poor community members with chronic disease at two subsidized clinics for the working poor. The study examined if participation in a CDSMP improved multiple post-program outcomes in this population. The sample, recruited from two rural clinics in a south central state, consisted of 48 middle and older adults (59.70+/-11.22 years) and was 79.2% Caucasian (n=38) and 20.8% (n=10) African American.

Results : The conceptual framework, process, content of the intervention as well as the feasibility and acceptability of study materials and methods, and effects of the intervention are reported. Significant improvements in perceived health status were noted on the health distress ($p<.01$) and energy/fatigue (p=.01) scales.

Conclusions: Study results accentuate the importance of evaluating intervention programs for specific populations and for a new practice exemplar that focuses

on patient-provider partnerships that can meaningfully improve health outcomes in underserved, poor, rural populations.

KEYWORDS : chronic disease self-management program, perceived health status, self management, patient-provider partnerships, rural, underserved populations.

Introduction

Chronic disease imposes an enormous economic and societal burden accounting for 70% of Americans deaths and 75% of annual health care costs.[10] Until steps are taken now to deal effectively with chronic diseases, our nation is headed for a serious financial and quality of life crisis. The Healthy People 2010 report challenged the community to take specific steps to ensure that quality health and a long life are enjoyed by all.[28] Awareness of the increased prevalence of chronic illness and the current health disparities in the U.S. makes this a challenging goal.

Chronic disease management may well be one of the most vital health care issues of the century. Switching from a palliative medical model to a participatory and prevention-based approach may provide Americans with a better quality of life, reduce unnecessary medical costs and lost productivity, and strengthen our national economy.[10] Exemplar clinical practice today encourages active patient participation.[24]

The Robert Wood Johnson Foundation emphasized and expanded on the national priorities for chronic illness care, establishing self-care and self-efficacy as priority areas.[20,23] Programs that incorporate self-care and self-efficacy have the potential to significantly reduce morbidity, mortality, and the cost of chronic illness. The individual has the most important role in managing their chronic disease; hence, perceived health status is a critical issue. Improving perceived health status, increasing perceived self-efficacy, along with providing culturally competent medical care and education, can empower clients to take control in the management of their chronic disease; a move that research has shown can improve outcomes.[9,14,21]

Recognizing the need, the Chronic Disease Self-Management Program (CDSMP) was developed.[27] Disease-specific educational programs traditionally focus on one particular disease, with little or no consideration of co-existing morbidities interaction or prevent the adherence to program recommendations. In addition, medical care and education provide clients with knowledge and skill; however, many clients already know the life style changes that are necessary to improve their health, but fail to implement them. The CDSMP reduced health care costs and significantly improved chronic disease outcomes.[17] The problems related to chronic disease control are multifactorial and programs should address the socio-cultural needs of the target population.[18]

Self-management is used to help participants become active partners with health care providers which enhances self-efficacy and perceived health status, decreases the need for health care utilization, and improves or maintains participant's clinical outcomes. Program participants developed increased confidence to take on an active role in their care. Self-efficacy is defined as one's belief that he or she can accomplish a specific behavior or cognitive state.[1] Efficacy enhancing strategies of skills mastery, modeling, reinterpretation of symptoms, and persuasion are used in the CDSMP. The presence of self-management support empowers patients with self-efficacy, enabling them to be their own disease manager and supports the physician-patient relationship and plan of care.[9]

Individuals with chronic disease have an increased mortality and morbidity, but the severe effects of these conditions on underserved minority and rural populations are disproportionate. In response to the intractable problem of health disparity, the CDC created Racial and Ethnic Approaches to Community Health U.S. (REACH) to address the health outcomes of diverse populations and discover whether interventions that are effective for majority populations are also effective for underserved populations. This program is demonstrating that health care disparity can be reduced and health status improved by developing innovative approaches in our communities, health care settings and work sites. Programs need to be offered in locations where people are, in the community.[29,31]

Culture defines how health care information is received, processed, and used. Health care is a cultural concept that develops from beliefs about the nature of disease and the human body; therefore, cultural issues are central to the delivery of health services, treatments, preventative interventions, and health promotion.[4] By understanding, valuing, and addressing cultural differences and examining their own values and beliefs, providers can better support a system that responds appropriately to the needs of the population served. To have successful programs, cultural issues and community needs must be addressed with adaptations that enhance communication between participants and providers.[18]

The current study was designed to address the health needs of an underserved, poor, rural, population of chronically ill middle and older adults using a tailored Chronic Disease Self-Management Program (CDSMP). The CDSMP leader's manual was used and supplemented with ideas based on Jean Goeppinger's work with rural African Americans.[8] Tailored to address the needs of African American participants, the study intervention program incorporated community-provider partnerships as a key strategy to improve the quality of health and eliminate health disparities in the sample. The original study was designed to examine multiple, post-program outcomes, which are too numerous to clearly and succinctly present in a single paper. Thus, this article reflects the changes in client's perceived health status reported by study participants following implementation of the tailored CDSMP.

Theoretical Framework

The development of this tailored intervention aimed at empowering participants with knowledge and skills for chronic disease self-management. Cultural context was central to the design of the intervention, which was created within the framework of self-efficacy theory. Self-efficacy is concerned with judgments of personal capability.[2] Chronic disease self-management is an ongoing pursuit and perceived self efficacy can predict the personal attainments of the desired goals. Perceived self-efficacy influences an individual's choice of activities and motivation along with confidence to mount and sustain the efforts required in lifestyle modification behaviors. An individual's capacity for making lifestyle changes is dependent on perceived self-efficacy, health status, physical and social environments, and resources available. Expectations of self-efficacy determine what behaviors will be initiated and maintained when faced with barriers.[2] A patient's perception and ability to generate solutions is critical for success with the multiple challenges associated with managing chronic disease.

Intervention

The Stanford Patient Education Research Center developed the CDSMP, and empirically tested a comprehensive, standardized program including train the trainer classes and patient education material.The CDSMP consists of classes given by trained lay leaders with chronic disease to community groups of 10-16 participants. These classes meet two and a half hours a week, for six weeks. A distinctive attribute of this program model is the recognition that many individuals have multiple chronic conditions, and that effective self-care strategies may parallel in different conditions; therefore, people with varying chronic health problems attend the program together.[27]

Topics addressed in the CDSMP include techniques to deal with everyday problems and include frustration, depression, fatigue, and anger; appropriate exercise to maintain flexibility, strength, and cardiovascular fitness; appropriate use of medications; communicating effectively with family, friends, and health professionals; benefits of healthy eating habits; strategies to evaluate new treatments; and problem solving and decision making skills. The CDSMP teaching process is based on Bandura's Self-Efficacy Theory[1] and includes strategies to develop a personal exercise program, and to enhance cognitive symptom management, problem solving, and communication skills. Activities designed to increase self-efficacy with each of these strategies included weekly action planning and contracting, modeling of behaviors, problem solving, and individual decision-making.[27]

Significant improvements have been noted in self-efficacy, health management behaviors, perceived health status, and health care utilizations following participation in the CDSMP program and these results have been sustained for over three years.[16] The CDSMP has been used across the United States and

internationally in a variety of settings, but there has been limited examination of its effectiveness with underserved, poor, rural, or minority populations.[7,11,21] Through pre and post program focus groups, three areas of the CDSMP that needed supplementation when working with African American populations were identified: (a) the addition of spirituality, (b) the need to address the health consequences associated with traditional dietary practices among African American populations (i.e., high intake of fats, sweets, and salt), and (c) communication with health care providers whose race differs from the chronically ill individual. In the current study, the CDSMP was tailored by incorporating these topics into the weekly brainstorming and problem-solving activities. In addition to facilitate a trusting and comfortable environment at least one of the leaders was an African American.[8]

The review of literature that served as the background for this study focused on self-efficacy within the context of self-management in chronic disease. Studies that included self-management programs indicate that the use of self-efficacy may have a profound impact on health promotion, patient education, and clinical practice. These comprehensive self-management programs demonstrated effectiveness and improved outcomes for clients. The success of self-efficacy approaches in health education has raised key questions about some of the traditional tenets that underlie typical health education programs.[2,5,6,7] In many patient education programs neither patients nor practitioners are taught the skills that will most enable each to carry out his or her role and responsibility for disease management. Better results occur with intense, active education versus passive teaching.[25] Effective teaching about chronic disease must be based more closely on the findings of behavioral theories and research, such as self-efficacy theory and evidence-based self-management programs[2,6,13] along with being culturally competent to address the socio-economic factors facing individuals.[18]

Method

By using a quasi-experimental pre-test, post-test design, this study evaluated the effectiveness of a health education program, the tailored CDSMP, in a rural, underserved, poor sample, which included a significant number of African Americans. Specifically, the outcome reported in this paper is post-program change in perceived health status.

Sample

Study results provided in this report reflect a pilot test of the intervention in the targeted population. The tailored CDSMP educational sessions were held at accessible and central community locations: a clinic activity room, a local university classroom, and a senior citizen center. Each site was chosen to facilitate participant recruitment and retention in the program. Participants were recruited from two, rural, subsidized clinics that provided care to the poor and

underserved. Participants received a free book, *Living with Chronic Conditions* , and an audiocassette relaxation tape entitled *Time for Healing.* Inclusion criteria were clients 40 years of age or older and diagnosed with at least one chronic disease and was met by 100 clients. Forty-eight participants consented to be in the study. The 48% participation rate achieved exceeds that typically observed in similar pilot studies.[3] The study sample consisted of 48 middle-aged and older adults and distribution was reflective of the area population. 19 A summary of sample demographic characteristics are presented in Tables 1 and 2.

Instruments and Measures

The instruments used in the study were CDSMP outcome questionnaires and the Self-Efficacy-Health Cantril ladder. The CDSMP measures are self-administered questionnaires with sub scales that were utilized to measure perceived health status, in addition to the outcomes that will not be described in this report (i.e., self-efficacy, self-efficacy-health, self-management behaviors, health care utilization, and clinical outcomes).

Changes in perceived health status were measured by using a 100mm horizontal Visual analog Scale (VAS) for rating current fatigue, pain/discomfort, and shortness of breath. In addition, several Likert scales measuring self-rated health, physical abilities, energy/fatigue, health distress, illness intrusiveness and activity limitations were also used to evaluate perceived health status. Table 3 provides a summary of the research question along with the instrument, reliability data, number of items, and type of scale included with each of the CDSMP study measures utilized.

Reliability and validity studies on the CDSMP specific measurement scales documented that these instruments are useful in measuring change in intervention studies, and are understood by and acceptable to patients and other research subjects. The tools and the available reliability data are summarized in Table 3. The program instruments are reliable and valid in African American, Hispanic, and Native American diverse populations and have been used extensively in the US, Canada, and internationally in England, Australia, Africa, and South America.[8,13,15,17] Study instruments were administered on the first day of class to obtain pre-program data and at the end of the program to assess post-program changes.

Procedure

After Institutional Review Board (IRB) approval and receiving participant's consent all baseline measures were obtained. The PI read the scales and provided assistance when needed. Each workshop session had between 10-20 participants. The program consisted of six, interactive sessions with emphasis on efficacy-enhancing strategies. Skills mastery was achieved though weekly

contracting behaviors and feedback. At the last session, the measures were repeated.

Trained lay leaders, using the CDSMP trainer manual that was tailored to meet the cultural needs of the sample population provided a step-by-step process. Instructive materials were available in the manual on how to facilitate each class. Presentation and discussion were the primary methods used for each session with an emphasis on developing action plans, goal setting, problem solving, decision-making, and feedback. Active participation was encouraged and group discussion facilitated. Each session had appropriate handouts, exercises assigned to the didactic content and audiovisual aids were used to reinforce and illustrate important concepts and skills.

Careful selection and development of lay leaders was crucial to the CDSMP success. These individuals fostered a community partnership that the participants respected and trusted. At each site, one of the local lay leaders had a chronic disease and the same cultural background as study participants. These lay leaders modeled behaviors, conducted frequent group problem solving sessions and promoted individual decision making. They facilitated the participants in moving to an action stage of change. Skills in action planning, setting confidence levels, self-reflection, and feedback were practiced to enhance self-efficacy to perform self-management behaviors conducive to controlling their chronic disease(s).

Data Analysis

Non-parametric statistical tests were used to analyze data. Although three different sets of classes were held to maximize participant learning, the planned statistical analyses were designed to examine pre and post-intervention outcomes for the entire sample. To determine if the participants in the three classes (i.e. 3 groups) were socio-demographically dissimilar, Kruskal-Wallis tests of group differences were conducted for interval level and Chi-square analysis for categorical demographic variables; these results are summarized in Tables 1 and 2. A liberal alpha priori level of significance ($p < .10$) was set for this preliminary test of the intervention in this underserved population, recognizing that this decision increased the risk of committing a type 1 error. Actual p-values are reported for all statistical tests.

Significant group differences were observed in age and the number of classes attended. The mean age (59.71 +/-11.22) for the sample was normally distributed, while the mean ages for group 1, group 2, and group 3 were 54.42+/-1.83, 55.38+/-2.57, and 69.18+/-2.17 years, respectively. Participants of groups 2 and 3 received health care from the same clinic and are therefore members of the same clinic population. The differences in mean ages between group 3 and groups 1 and 2 are the result of the geographical sites chosen to hold classes for the CDSMP. Free or subsidized transportation to the senior citizens center was

available to eligible seniors. Thus, group 3 participants were older because of self-selection to the senior center site.

Significant differences in class attendance were also noted among the 3 groups. All members of groups 1 and 3 attended 6 classes, while some members of group 2 missed one class. Group 2 included more African American participants than groups 1 and 3 (see Table 1). This difference was due to African Americans residing in this geographical location celebrating August 8 th, the day that commemorates the Emancipation Proclamation. After classes started the lay leaders became aware of this scheduling issue. Due to time constraints, the lost day could not be rescheduled, but the group decided to add the content missed to the previous and subsequent class around that holiday. This alteration may have threatened the integrity of the study intervention for this group. To assess this potential threat to the internal validity of the study a Kruskal Wallis Test of group differences was performed to determine if post-intervention scores differed by group. Significant group differences ($p < .10$) occurred in self-efficacy health and self-efficacy to manage symptoms, disease, and self-management activities. Examination of group mean and median scores indicated that most group differences occurred after the intervention and were likely the result of group 3 (the older group), rather than group 2 (the group that included the largest percentage of African Americans). Given these findings and acknowledged limitation, study data were treated as one sample and subsequent statistical analyses are presented for the entire sample. The groups were similar in most areas as outlined in Table 1.

The Kruskal Wallis test indicates that group differences were present but does not provide information regarding which groups were significantly different from the other. Group mean and median values suggest that group 3 participants had better scores on these measures; however, paired differences were not analyzed. The Mann Whitney Test, to allow for multiple group comparisons, was not performed because of the threat of a type 1 error. The groups were very similar on other key variables such as gender, ethnicity, and their disease profile (i.e., presence or absence of diabetes, hypertension, arthritis, hyperlipidemia, cancer, etc.) as outlined in Table 2..

The research question presented addressed changes in perceived health status prior to and following completion of the program intervention. The mean score at pre-program baseline was subtracted from score obtained at the completion of the six-week post-program measurement period to derive a new variable subjected to a Wilcoxon Signed Rank tests.

Results

Results of the Wilcoxon Signed Rank tests revealed that significant changes occurred from pre-to post program for two study variables. A limitation of this statistical procedure is that it does not indicate whether changes reflect an

improvement or decrement following the intervention; results only indicated that a significant change occurred. To assess whether changes reflected an improvement, both the means and medians were examined at both time points. These data are provided in Table 4.

Significant decreases were reported by participants in areas of health distress (p=.01) and energy/fatigue (p=.01). The mean and median scores suggested less distress about health status and energy/fatigue. The mean and median scores of several other indicators of perceived health status also improved. The median and mean of VAS fatigue and shortness of breath over the past two weeks also decreased. Illness intrusiveness median and mean scores, which indicated the degree of negative impact the chronic disease(s) had on study participants, also decreased. As with several other indicators median and mean scores decreased after completion of the program; however these results were not statistically significant. Self rated health, physical abilities, and activity limitations scores did not reflect significant changes between measurement points. Although there were reductions in most indicators of perceived health status, only health distress and energy/fatigue were significantly reduced following the program care providers. A summary of Wilcoxon Signed Rank test results is provided in Table 4.

Limitations

A major limitation of the study is the inherent problems of using a convenience sample and quasi-experimental design, which limits the external and internal validity of study findings. Approximately 48% of the targeted clinic populations participated in this study and previously published controlled studies have found significant improvements increases the likelihood that findings are relevant for the population and other demographically similar populations. Another limitation was the short-term follow-up for integrating lifestyle behavior changes take time. A longer follow-up period may have resulted in a clearer evaluation of the program effectiveness. The fact that several improvements were evident in this early follow-up period is promising.

It is important to consider the possibility that both type I and type II errors may have occurred due to the small sample size and multiple comparisons. Statistically significant findings could be due to chance, but the changes observed are very similar to changes published in a larger, more powerful studies on the effectiveness of the CDSMP. 13,14,15 Studies conducted suggest that tertiary prevention applied to a chronically-ill underserved rural population with a significant number of African Americans may be a low-cost means of improving elements of health status.[8,14,26] Implementation of this and similar programs is needed as underserved rural populations are disproportionately affected by chronic disease and its complications.

Discussion

Results indicated that the CDSMP was efficacious in the study sample, improving two perceived health status variables, health distress (p=.01) and energy/fatigue (p=.01). Although not statistically significant, clinically relevant improvements in fatigue and shortness of breath were reported along with a decrease in illness intrusiveness. No differences were demonstrated for self-rated health, pain, physical abilities, and activity limitations. These results were similar to the findings in literature which reported significant improvements in five health status variables: activity limitation, disability, energy/fatigue, health distress, and general health and clinical improvements in patients' perceived pain and shortness of breath.[14,16] These findings are consistent with findings of the current study and the differences may be attributed to the different design of the study, specifically the shorter follow-up period included in the current study.

The literature reported emotional distress was significantly associated with adherence to self-care behaviors in patients. The research study suggested that cognitive-behavioral, psycho-educational interventions directed at increasing one's involvement in daily treatment decisions may lead to reductions in emotional distress and improved self-care.[34] Results of the current study appear to support this premise.

Chronic diseases create similar problems, yet these problems are more or less salient for an individual patient at different times across diseases. The CDSMP was designed to meet such a challenge by aiding patients to identify their individual needs and problems and then assist them to work most intensively in those areas. Because of the heterogeneous patient mix, not all patients had the same symptoms, nor did they all need to change the same behaviors. The results of the primary analysis of specific outcomes may have underestimated individual improvements because they contained data from subjects who either did not have a target symptom or behavior to change. Though not statistically significant, the improvements in fatigue and shortness of breath along with the decrease illness intrusiveness are clinically important for they add to the participant's quality of life. Any improvement in these areas would likely improve perceived health status; therefore, increase motivation to continue productive self-management behaviors.

The primary care provider confirmed participant's diagnoses and knew of their study participation, but there was no association between the CDSMP content and the individual treatment plans of study participants. The benefits achieved were additional to those achieved by usual care. Participants were volunteers recruited from poor, underserved, rural clinics and active participation, excellent attendance, and zero attrition showed the intervention's acceptability and potential feasibility of incorporating the CDSMP into routine health care. Anecdotally, participants voiced that eliminating barriers such as transportation, dedication of lay leaders, frequent positive feedback, role-modeling behaviors and social support gained from group members contributed to their overall satisfaction of the program. The participants reported a desire to continue the

group support to foster the positive reinforcement of desired behaviors. Conceivably, integration of a CDSMP with usual care, perhaps at the outset of a chronic disease diagnosis would further enhance potential benefits.

The researchers purposively studied an underserved, rural, poor population comprised of a significant number of African Americans because it has not been adequately represented in past chronic care studies that tested interventions to improve clinical outcomes. To improve chronic disease management in poor, underserved, rural population providers need to listen and partner with these individuals and programs need to be offered in community locations.[31,32,33] Most people with chronic disease need more than brief encounters that typically occur with health care provider.[30,33] The CDSMP offers more than disease specific information for it provides an opportunity to practice skills in a favorable environment. People with chronic disease need a chance to practice strategies to manage their illness, report back results of actions, and receive feedback. The CDSMP would be a reasonable substitute for, or adjunct to, the more traditional single disease education program.

An individual's belief about their perceived health status and management of their chronic disease are equally important and may be even more important than what patients know about their disease(s). Patients experienced statistically significant improvements in perceived health status. The results of this study suggest that this intervention is feasible, acceptable to the population, and is beneficial beyond usual care in terms of improved perceived health status and self-management behaviors. Because other published CDSMP studies also suggest effectiveness, health care systems should consider implementing self-management programs for patients with chronic conditions. These study results underscore the need for careful evaluation of education programs about chronic disease, particularly with poor, underserved, rural populations.

Table 1

Differences in Demographic Attributes for Interval Level Data by Group*

Variable	Mean (Mean Rank)			X^2	DF	p-value
	Group 1 n=14	Group 2 n=18	Group 3 n=16			
Age (years)*	54.42 (17.46)	55.38 (19.39)	69.18 (36.46)	17.55	2	.0002
Education (years)	12.35 (24.32)	12.94 (26.17)	11.93 (22.78)	0.54	2	0.76
Diseases (number)	2.92 (28.00)	2.61 (28.21)	1.19 (24.69)	1.86	2	0.39
Classes	6.00 (30.50)	4.67 (14.50)	6.00 (3.050)	25.50	2	< .001

(number)*							

NOTE: *Denotes a significant between group differences. Group differences were assessed using Kruskal-Wallis Test for group differences.

Table 2

Chi Square Analysis of Categorical Data by Group

	Group 1 (n=14)	Group 2 (n=18)	Group 3 (n=16)	Sample (N=48)
Ethnicity				
White	14 (100)	9 (50.00)	15 (93.75)	38(79.2)
Black*	0 (0)	9 (50.00)	1 (96.25)	10(20.8)
Gender				
Female	11 (78.57)	15 (83.33)	13 (81.25)	39(81.3)
Male	3 (21.43)	3(16.67)	3 (18.75)	9(18.7)
Marital Status				
Married	8 (57.14)	3 (16.67)	5 (31.25)	16(33.00)
Separated	4 (28.57)	5 (27.78)	4 (25.00)	13(27.08)
Single	2 (14.29)	5 (27.78)	2 (12.50)	9(18.75)
Widowed	0(0)	3 (16.67)	5 (31.25)	8(16.67)
Divorced	0(0)	2 (11.11)	0(0)	2(4.17)
Diseases				
Hypertension	11(78.57)	8(44.44)	9(56.25)	28(58.3)
Chronic pain	3(21.43)	6(33.33)	0(0)	25(52.1)
Diabetes	10 (71.43)	4 (22.22)	8 (50.00)	22(45.8)
Arthritis	5 (35.71)	5 (27.78)	6 (37.50)	16(33.3)
Hyperlipidemia	5 (35.71)	4 (22.22)	2 (12.50)	11(22.9)
Lung Disease	1 (7.14)	3 (16.67)	5 (31.25)	9(18.7)
Heart disease	1 (7.14)	3 (16.67)	5 (31.25)	9(18.7)
Depression	1 (7.14)	3(16.67)	0 (0)	4(8.3)
Cancer	1 (7.14)	2 (11.11)	0 (0)	3(6.23)
More than 1				37(70.8)
More than 3				22(45.6)

*Denotes a significant difference in groups. The Mantel-Haenszel Chi Square test was used for variables (hyperlipidemia, and depression) with counts less than 5 per cell. Totals are greater than 100% as most study participants had multiple chronic diseases.

Table 3

Research Question, Instruments, Reliability (R), Number of Items, Type of Scales Used

Research Question	Instruments/Reliability (R)	Items	Type of Scale
1. What change in perceived health status occurred?	General Health Rating (R=.92)	1	Likert-type
	Visual Analog scales (VAS) for: fatigue, discomfort/pain, and shortness of breath	3	VAS (100mm)
	Health Distress subscale (R=.87)	4	Likert-type
	Energy/Fatigue subscale (R=.87)	3	Likert
	Physical abilities subscale	5	Likert-type
	Illness Intrusiveness subscale (R=.89)	13	Likert
	Activity limitations subscale (R=.91)	4	Likert-type

Table 4

Changes in Perceived Health Status (N=48) Pre and Post Program Participation

Variables	Signed Rank	p-value	Pre-Program	Values	Post-Program	Values
			Median	Mean	Median	Mean
Self-rated health	-75.50	0.13	3.00	3.04	3.00	2.65
Fatigue**	-71.50	0.16	5.00	4.75	4.50	4.10
Pain/discomfort	-42.50	0.42	3.00	3.73	3.00	3.35
Shortness of breath **	-55.00	0.13	2.50	3.23	1.00	2.52
Health distress *	+141.00	0.01	2.00	1.82	1.50	1.54
Energy/fatigue *	-139.00	0.01	2.20	2.24	2.10	2.06
Physical abilities	-43.50	0.30	1.13	1.31	1.13	1.26
Illness Intrusiveness **	-45.00	0.57	2.31	2.48	2.05	2.34
Activity limitations	-53.00	0.34	1.25	1.41	1.25	1.29
NOTE. * Reflects a statistically significant change (p <.01) in values from pre to post-program, and ** denotes some improvement (but not statistically significant)						

in the outcome measure from pre-program to post-program. Wilcoxon Signed Rank tests were performed to assess pre to post-program differences.

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