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A Pilot Study of Chronic Disease Self-Management in a Homeless Population

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Abstract—**This pilot project developed, implemented, and evaluated the Stanford Chronic Disease Self-Management Program (CDSMP) with sheltered homeless adults (N=10). Participants demonstrated positive change in self-rated health, health distress, self-efficacy, exercise behaviors, and communication. The CDSMP may be effective with homeless clients if additional incentives are incorporated to overcome barriers to success.**

Keywords-chronic illness, homeless clients, community health, self-efficacy

I. Introduction

The Affordable Care Act has emphasized "Better health, better health care, and better value" as the *Triple Aim* to optimizing health system performance [1]. Providing evidence-based care to increasing numbers of adults with multiple chronic conditions is becoming more of a priority for healthcare systems in light of the emerging health care reform initiatives. In an effort to help advance chronic illness programs and policies of public health organizations, the Institute of Medicine (IOM) delivered a comprehensive guide to chronic illness in a call for public health action. The guide calls for the need of enhanced surveillance, interventions, and policies to decrease the effects of chronic illness and emphasizes the need for coordinated action in both healthcare and community-based settings [2].

One community-based intervention that has demonstrated success in rigorous evaluation is the Stanford Chronic Disease Self-Management Program (CDSMP) [3]. The CDSMP, based on Social Learning Theory, is delivered in small group workshops (2.5 hours/week for 6 weeks) and delivered by two trained peer leaders. Key components and topics include action planning, problem solving, exercise, mind/body techniques, healthy eating, communication skills, and working with the healthcare provider and system. In addition to fewer hospitalizations and decreased length of stays, evaluation of the CDSMP has demonstrated significant improvements in exercise, cognitive symptom management, communication with health care professionals, general health, health distress, fatigue, and social/role activity limitations [3]. The CDSMP has been tested in many settings with different populations, but has not been evaluated with homeless clients.

In homeless populations, cardiovascular disease, diabetes mellitus, and other treatable and preventable chronic illnesses contribute heavily to excess morbidity and mortality [4]. Homeless persons face significant barriers to their most basic healthcare needs, including nutrition, safety, hygiene, and shelter. Transportation issues and the inability to keep medications and treatments become lower priorities when they need to focus on basic survival skills. In a recent national study, the unmet health needs for homeless, as compared to the general population, could be anywhere from six to ten times greater [5].

The purpose of this project was 1). To develop, implement, and evaluate a pilot intervention of the Stanford CDSMP with case management and other components specifically tailored to chronically ill sheltered homeless clients and 2). To compare results with other populations with chronic illness.

II. Methods

A. Program Design and Intervention

This pilot project was a non-experimental one group pretest/posttest design. Participants were a convenience study of homeless clients (n = 10) who were diagnosed with a chronic illness and resided at a faith-based homeless shelter in a mid-Atlantic state. To be eligible to participate, participants had to be at least 18 years of age, have a self-reported chronic illness, be in good standing with the shelter, and able to speak English.

The program occurred over a 4 month timeframe and was targeted, personalized, and intensive. The cornerstone of the intervention was the Stanford Chronic Disease Self-Management Program. An additional component of this intervention was intensive nursing case management. Case management has been identified as a key strategy to support homeless populations, especially those with complex needs. Several models of standard case management for homeless persons have been developed that provide outreach,

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assessment, planning, linkage, monitoring, and advocacy [6]. In a recent systematic review of the literature, case management was a predominant intervention used in order to improve outcomes in patients with multi-morbidity [7].

To give additional support to the participants, a heart health navigator (a registered nurse) completed a cardiovascular disease risk assessment and also functioned as an integrative health coach. Integrative health coaching empowers clients to make lasting health behavior changes that are the cornerstones of lifelong well-being [8].

Other program incentives were incorporated to reduce barriers to success in the homeless population. Pedometers and "Choose My Plate" samples were given to each participant during the third week of the intervention [9]. A stationary bike and a small refrigerator were purchased and placed at the shelter to reduce barriers to exercise and healthy snacks. A grocery store fieldtrip to learn about healthy food choices with the program staff and health coach completed the intervention. A final incentive of a $50 gift card to a grocery store was used to encourage participant program completion.

Table I summarizes a description of the intervention and components of the adapted curriculum.

TABLE I. INTERVENTION DESCRIPTION

Intervention	Description and Components
Chronic Disease Self-Management Program (CDSMP)	Participative scripted workshop licensed by Stanford Patient Education Research Center that promotes self-management of chronic disease. Six sessions facilitated by 2 trained leaders. Sample topics include action planning, problem-solving, sleep, difficult emotions, exercise, medications, working with health care provider and system.
Nursing Case Management	Visited the participants weekly to allow seamless services from multiple organizations. Coordinated services, offered support, advocated for clients, organized transportation and scheduled lab collections.
Heart Check	Purpose is to identify and minimize cardiovascular disease risk. Provides participant with awareness, learning, confidence and self-prescribed goal setting. Initial consultation is 60 minutes, follow-up consultation is 30 minutes. Diagnostic labs include lipid panel, Glucose, C-reactive protein. Also includes cardiovascular risk assessment, stress management, tobacco cessation, and goal setting.
Integrative Health Coaching	Two 60 minute sessions focused on individual self-efficacy and self-determined accountability to achieve optimal short and long term health goals. Components include mindfulness awareness and individual coaching partnership.
Grocery Store Tour	Scavenger hunt of nutrient rich foods and selection of meal from salad bar using the plate method. Components included label reading and interpretation, application of plate method, and facilitated peer education.

B. Data Collection and Measures

After Institutional Review Board (IRB) gave approval for the study, a pretest-posttest paper/pencil survey was given at the first session and final session of the six week workshop. For clients with low literacy levels, the surveys were read to them in an interview format. Biophysical measures, including Body Mass Index (BMI), lipid panels, and blood glucose levels, were collected during the first week of the intervention and at six weeks post intervention.

Baseline questionnaires included demographic information (age, gender, years of education, marital status, and ethnicity). Nine variables were measured including self-rated health, health distress, fatigue, shortness of breath, pain, exercise behaviors, self-efficacy, communication with health care profession, and health care utilization. Table II shows the variable scales, descriptions, and references.

Table II. Variables, Description, and References

Variable	Description	Reference
Self-rated Health	Single item Likert scale Higher score indicates poorer health	Idler & Angel, 1990 [10] Lorig, Stewart, Ritter, Gonzalez, Laurent, & Lynch, 1996 [11]
Symptom Management/ Health Distress	4 item Likert scale Lower score indicates better symptom management	Stewart, Hays, & Ware, 1992 [12] Lorig, et al., 1996 [11]
Fatigue/ Shortness of Breath/Pain	Visual Analog Scale 0-10 Lower score indicates less fatigue/shortness of breath/pain	Ritter, Gonzalez, Laurent, & Lorig, 2006 [13]
Exercise Behaviors	Calculated number of minutes of stretching/ aerobic activity for 6 activities	Lorig, et al., 1996 [11]
Self-efficacy for Managing Chronic Disease	6 item scale 1-10 Higher score indicates higher self-efficacy	Lorig, Sobel, Ritter, Laurent, & Hobbs, 2001 [14]
Communication with Healthcare Provider	4 item Likert scale Higher score indicates better communication	Lorig, et al., 1996 [11]
Health Care Utilization	4 single item self-report	Ritter, et al., 2006 [13] Lorig, et al., 1996 [11]

All participants who returned questionnaires were included in the initial analyses regardless of how many sessions they attended. However, only the post-tests results were calculated for participants who completed the program. Results of the surveys and the biophysical measurements were loaded into a Statistical Package for Social Sciences (SPSS) for analysis. Descriptive statistics were calculated and summarized and compared to other populations with chronic illness [3]. A confidential identifier maintained the confidentiality of the participants.

III. Evaluation and Results

Participants who completed the baseline assessment had an average age of 47 years and 13 years of education. Four of the 10 participants reported two or more chronic conditions. Ninety percent were non-Hispanic white and 60% were female. The most frequent chronic conditions reported were diabetes and arthritis (50% of participants).

Six out of ten participants completed the program (60%) and both pretest/posttest assessments. During the course of the intervention, three participants were evicted from the shelter, but two of them were permitted to return for the post-intervention measurements. One participant (male) discontinued the program voluntarily and did not complete the posttest assessments. Another participant transitioned to permanent housing during the intervention and was lost to follow up.

A. Changes in Health Outcomes

Table III shows that positive improvements were observed for the variables of self-rated health, health distress, exercise behaviors, self-efficacy, and communication with healthcare professionals. The variables of fatigue, shortness of breath, pain, and health care utilization showed no improvements. It should be noted that that the CDSMP intervention is six weeks long, so that may be the reason for little change between the two data collection points. However, compared to other populations, the homeless participants in this study had many more visits to a healthcare provider for physical health (8.0) compared to other populations (5.33). At this shelter site, a Nurse Practitioner holds a clinic each week for residents so these study participants had access to these healthcare services.

TABLE III. CHANGES IN OUTCOME VARIABLES BETWEEN PRETEST/POSTTEST FOR HOMELESS PARTICIPANTS (N = 6)

Construct			
	Pretest Mean/ SD	***Posttest Mean/ SD***	***Other Populations with Chronic Illness[a]***
Self-rated Health (1-5) ↓ [b]	3.6/1.7	3.3/1.5	3.29 (N = 51)
Heath Distress (1-5) ↓	3.2/2.1	2.0/1.4	2.04 (N = 51)
Fatigue (0-10) ↓	6.1/3.8	7.1/2.4	4.89 (N = 122)
Shortness of Breath (0-10) ↓	5.0/2.4	5.3/2.4	2.43 (N = 122)
Pain (0-10) ↓	7.0/3.5	8.0/2.1	4.36 (N = 122)
Exercise Behaviors (minutes/week) ↑			
Stretching (Range 0 -180)	62.5	65	40.1 (N = 1,127)
Aerobic Exercise (Range 0 – 540)	135	192	90.6 (N = 1,130)
Self-efficacy (1-10) ↑	3.6/2.0	7.0/2.1	5.17 (N = 605)
Communication with Healthcare Provider (0-5) ↑	1.6/2.2	2.6/1.3	3.08 (N =1,130)

a. Reported by Chronic Disease Self-Management Program Questionnaire Codebook, Stanford Patient Education Research Center (2007)

b. ↑ indicates a higher score is better; ↓ indicates a lower score is better Parentheses after each variable gives the possible ranges of the scale

B. Biophysical Measures

Pretest and posttest biophysical measures were compared on the six participants who completed the CDSMP intervention. Overall, the results appear to have little change. Only one participant had a reduction in BMI, cholesterol, and triglycerides after a 14 lb. weight loss. However, five of the six participants increased their HDL levels, with one participant showing no change. This finding affirms the self-reported increase in exercise behaviors by the participants who completed the program.

C. Lessons Learned

This intervention experienced a large attrition rate attributed to the transient nature of homeless persons. This attrition rate and/or failure to complete the program has been experienced by other chronic disease management programs working with vulnerable populations, including those with serious mental illness and homeless veterans [15] [16] [17].

While the current project demonstrated positive changes in many of the variables, there were few changes in the health outcomes of fatigue, shortness of breath, or pain. While this was puzzling, the time between data collection points was only six weeks. In addition, with increased activity levels, there may be a temporary increase in these symptoms. A recent CDSMP meta-analysis addressed these outcome differences across studies and may reflect a variety of methodological and programmatic differences, such as time between data collection points and program delivery formats [18]. For the homeless population in this study, the pretest scores on fatigue, shortness of breath, and pain were much higher at baseline when compared with other population who participated in the CDSMP.

IV. Implications

Three important implications can be learned from this pilot project. First, case management services are an important component when working with health programs involving homeless populations. Case management has been identified as a strategy to support homeless individuals with complex needs [6]. Services delivered by case managers include practical support, help with developing independent living skills, advocacy, support for medical and psychiatric treatment, and assistance with accessing social and professional support systems [19]. The case manager was involved with the program staff to help troubleshoot the many challenges in working with homeless populations.

Secondly, homeless populations often lack the necessary resources to make changes in their health behaviors due to limitations of poor transportation, the inability to acquire healthy food, and barriers to exercise. During the course of this intervention, the participants were provided with transportation services, a refrigerator to store healthy snacks, a plate to help with portion control, and

additional exercise equipment stored at the shelter to reduce the barriers to success. The participants reported that they rarely had a choice of food selection and often ate high fat and calorie dense meals that were donated to the shelter. The additional incentives of a grocery store gift card and a new refrigerator to store their snacks helped to overcome these often unidentified barriers to success. A follow up intervention is being planned to target nutritional education for the faith-based groups who are donating the meals to the shelter to emphasize the importance of offering healthy choices to those shelter residents who suffer from a chronic disease.

Lastly, healthcare providers, including nurses can begin to increase skills and comfort levels in working with homeless populations through community-based programs such as the CDSMP. Nurses already possess skills in analytic assessment, determining multiple determinants of health, and building community partnerships [20]. Taking a population-focused approach to the management of chronic conditions is an important component of success for community-based programs targeting chronic disease self-management. Currently, most of the program staff involved in this intervention, including the case manager, continue to volunteer with health programs for the homeless in the same community.

V. Conclusions

The replication of this pilot program is now in the planning stages at other homeless shelters and a primary care clinic that serves veterans in the community. Based on this pilot study, the CDSMP can be effective with homeless clients if additional case management and incentives are incorporated to overcome barriers to success. Sheltered homeless individuals can reap tremendous health benefits from established and proven programs, such as the CDSMP.

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