Living Well: An Intervention to Improve Self-Management of Medical Illness for Individuals With Serious Mental Illness

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Objective: **Individuals with serious mental illness have elevated rates of comorbid chronic general medical conditions and may benefit from interventions designed to support illness self-management. This study examined the effectiveness of a modified version of the Chronic Disease Self-Management Program called Living Well for individuals with serious mental illness.** ***Methods:*** **A total of 63 mental health consumers with serious mental illness and at least one concurrent chronic general medical condition were randomly assigned to receive the 13-session peer-cofacilitated Living Well intervention or usual care. Participants were evaluated on attitudinal, behavioral, and functional outcomes at baseline, at the end of the intervention, and at a two-month follow-up.** ***Results:*** **Living Well participants showed significant postintervention improvements across a range of attitudinal (self-efficacy and patient activation), behavioral (illness self-management techniques), and functional (physical and emotional well-being and general health functioning) outcomes. Although attenuation of effect was observed for most outcomes at two months postintervention, evidence was found of continued improvement in general self-management behaviors (use of action planning, brainstorming, and problem-solving). Continued advantage was found for the Living Well group in other areas, such as health-related locus of control and reports of healthy eating and physical activity. Receipt of Living Well was associated with a notable decrease in use of the emergency room for medical care, although the between-group difference was not statistically significant.** ***Conclusions:*** **Living Well shows promise in helping mental health consumers more effectively manage chronic general medical conditions and experience improved functioning and well-being. (*Psychiatric Services* 64: 51–57, 2013; doi: 10.1176/appi.ps.201200034)**

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Individuals with schizophrenia and other serious mental illnesses die at a younger age than persons in the general population (1). This excess mortality results from higher prevalence and greater severity of comorbid chronic general medical conditions, such as diabetes, respiratory illnesses, and cardiovascular disease (2–5). Physical inactivity (6,7), poor diet (8), smoking (2–4), medication nonadherence (9), and limited health literacy (10,11), all common among individuals with serious mental illness, may also contribute to the elevated incidence of general medical illness and complicate efforts to manage these medical problems once they have developed.

In recent years, a number of lifestyle interventions have been developed to help consumers of mental health services engage in physical activity, better manage their weight, eat a more balanced and healthier diet, and engage in health promotion activities (12). Evidence is also accumulating of the effectiveness of interventions that improve self-management of chronic general medical conditions in the general population (13–17). Studies have shown that one such intervention, the Chronic Disease Self-Management Program (CDSMP), improves health-related attitudes and behaviors and health status and enhances utilization of medical services among adults in the general population who have chronic medical conditions (18,19). The

CDSMP is a six-session peer-facilitated intervention delivered in 2.5-hour group sessions that emphasizes training in disease self-management, including action planning, feedback and support from peers, and problem solving (20,21).

Current evidence suggests that self-management strategies help individuals with serious mental illnesses to cope more effectively with psychiatric symptoms (22). However, less attention has focused on extending these strategies to self-maintenance of general medical wellness. Even fewer studies have included consumers of mental health services as group facilitators for such interventions. This is all the more striking given the multiple benefits of peer-delivered programs (23,24) and the growing concerns regarding the general medical problems of mental health consumers. In this context, there is a need to extend the success of chronic disease self-management programs that have been developed for the general population to individuals with serious mental illness.

Druss and colleagues (25) recently developed and tested an adaptation of the CDSMP for mental health consumers in a randomized trial involving 80 participants with one or more chronic general medical conditions and a co-occurring psychiatric diagnosis of bipolar disorder (33%), schizophrenia (29%), major depression (26%), or posttraumatic stress disorder (11%). The intervention retained the core CDSMP structure and was delivered in six sessions by peers at a single urban community mental health center. At the six-month follow-up, participants in the experimental condition had a significantly greater improvement in patient activation and more primary care visits than those in usual care; no significant differences between groups were found in quality of life related to general health, physical activity, or medication adherence. Effect sizes, however, were similar to those found for the CDSMP when delivered to individuals without serious mental illness (26), suggesting the promise of the intervention for consumers of mental health services.

In a separate effort, our team also developed and evaluated a modified and enhanced version of the CDSMP. Called Living Well, our intervention extensively modified the original CDSMP program in content, structure, and implementation for more targeted use in prototypical psychiatric clinic settings and rehabilitation settings that serve individuals with serious mental illness. We hypothesized that Living Well would produce improvements in attitudinal, behavioral, and functional outcomes and reduce use of emergency department medical services. We also examined whether outcomes persisted two months beyond delivery of the weekly intervention.

Methods

Intervention development

An advisory panel comprising a mental health consumer and study investigators met every other week for three months (July to September 2007) to consider modifications of the original CDSMP intervention for outpatients with serious mental illness. We then pilot-tested the modified program with five consumers and collected participant feedback. The adapted program, called Living Well, was then manualized for use in a randomized controlled trial.

Living Well retains key elements of the original CDSMP, including a focus on individuals with any number of chronic general medical conditions. The intervention is based on the assumption that self-management tasks for various conditions are similar. Living Well also retains the CDSMP focus on confidence building to help participants develop improved self-management skills. However, we made several changes to optimize the use of the curriculum in mental health settings serving outpatients with serious mental illness.

First, to maximize implementation flexibility, Living Well was designed to be delivered either by two mental health peers or a mental health provider and a peer coleader. Second, to accommodate clinic schedules and reduce attentional burden, Living Well was delivered in weekly 60–75 minute sessions for 13 weeks instead of the six weekly 2.5-hour sessions specified in the CDSMP. The first three sessions of the Living Well intervention focus on the basic strategies of self-management, including action planning, peer feedback and support, modeling, and problem solving. The remaining weekly sessions focus on training in specific disease management techniques and the application of these skills to the topics of nutrition, exercise, sleep, medication management, addictive behaviors, and coordination of general medical and psychiatric services. Between sessions, peer facilitators telephoned group participants to review progress on their weekly action plan.

Third, Living Well contains new materials, including a tool to track action plans and self-management goals. All participants in the Living Well groups complete a personal health workbook. Fourth, Living Well includes an additional module focused on communicating with medical providers. Fifth, although the original CDSMP curriculum addresses the interconnections between physical and emotional well-being, the Living Well curriculum includes additional topics, such as how serious mental illness can affect general medical status and vice versa. Finally, Living Well includes two monthly booster sessions held during the two months after the end of the weekly intervention.

Study design

We conducted a randomized controlled trial comparing Living Well to usual care in four Baltimore-area mental health settings, including one outpatient clinic and three psychiatric rehabilitation day programs. All study participants gave written informed consent, and the study was approved by all relevant institutional review boards. The study was conducted between June 2008 and March 2010. Outcomes were assessed immediately after the intervention and again two months later.

Participants

Individuals were eligible for the study if they had a chart diagnosis of a schizophrenia spectrum disorder or bipolar disorder with psychotic features, a chart-documented diagnosis

of at least one chronic general medical condition (including but not limited to diabetes, asthma or chronic obstructive pulmonary disease, cardiovascular disease, and arthritis), community residence, and capacity to provide informed consent. A review of clinic rosters identified 237 individuals who met inclusion criteria; 127 were approached to participate and 63 (50%) consented, 57 (45%) refused, and seven (6%) failed the consent process or withdrew before randomization. Of these 63 participants, 32 were randomly assigned to Living Well and 31 to usual care.

Procedures

Four of the six Living Well groups were cofacilitated by two mental health peers who were also diagnosed as having at least one chronic general medical condition, and two were cofacilitated by a mental health professional and one of the peer providers. The study's principal investigator, who had completed the five-day CDSMP master training course and oversaw its modifications for Living Well, trained all leaders. The principal investigator (RWG) also supervised group leaders during the trial. All participants completed a 60–75 minute assessment administered at baseline, after completion of the intervention, and at the two-month follow-up.

Measures

The general health functioning, physical functioning, and emotional well-being subscales of the 12-item Short-Form Health Survey (SF-12) (27) were used. Higher scores indicate better functioning.

Several attitudinal measures were used. The 6-item Self-Management Self-Efficacy Scale was also used in the original evaluation of the CDSMP (28). Items are scored on a Likert scale from 1, not at all confident, to 10, totally confident. Higher scores indicate greater self-efficacy. The 13-item Patient Activation Scale (29) reflects an individual's perceived ability to manage his or her illness and to act as an effective patient. It includes two subscales: activation level and approach to health care. Higher scores reflect greater activation. The 18-item Multidimensional Health Locus of Control (30) assesses expectations about control of one's health. We used the internal locus of control subscale. The 24-item Recovery Assessment Scale–Short Form (31) measures recovery orientation. Higher scores indicate stronger recovery-oriented attitudes.

For behavioral measures, we used the 18-item Instrument to Measure Self-Management (28), which is based on the items used in the original evaluation of the CDSMP and includes six subscales: healthy eating, physical activity, accessing social support, behavioral and cognitive symptom management, making better use of health care (including preparing questions for medical providers to discuss medication concerns), and general self-management behaviors (use of action planning, brainstorming, and problem solving). Items are scored on a Likert scale reflecting frequency; scores range from 1, never, to 5, always. The four-item Morisky Medication Adherence Scale (32) was used to measure medication adherence.

Questions regarding use of emergency department services over the previous six months were included.

Statistical analyses

For each continuous scale outcome, we used a mixed-effects model to compare the mean response at posttreatment between the Living Well and usual-care groups, adjusting for baseline score and accounting for group (treatment cohort) effects. Effect sizes were calculated as the adjusted mean difference divided by the adjusted pooled standard deviation. All participants assessed at posttreatment were included in these analyses. An extension of this model that included scores at all three assessments (baseline, posttreatment, and follow-up) was used to compare adjusted mean response at the follow-up assessment in order to examine the sustainability of effect. All participants with at least one postbaseline assessment were included in these analyses.

To compare the proportion of participants with an emergency department visit between the Living Well and control conditions, a logistic mixed-effects model was used to account for group effects. In exploratory analyses among those in the Living Well condition, we compared outcomes of participants who were in groups led by a peer and a professional versus those led by two peers. These analyses used models parallel to those described above. For all analyses, p values of .05 or less were interpreted as statistically significant. Because this was a pilot effort, we did not correct for multiple tests.

Results

Feasibility of the intervention

Of the 32 participants randomly assigned to Living Well, 25 (78%) attended at least one of the 15 sessions and 19 (59%) attended at least five sessions. Among these 19 participants, the mean±SD number of sessions attended was 10.6±3.1, the median was ten, and the mode was 12. Of the 63 participants in the total sample, 58 (92%) completed the postintervention assessment and 57 (90%) completed the two-month follow-up assessment. Follow-up rates did not differ significantly between conditions.

Sample characteristics and outcomes

Table 1 presents data on the characteristics of participants. Data on functional, attitudinal, behavioral, and service use outcomes measured at the end of the intervention and again at follow-up are summarized in Table 2.

Functional outcomes. At the postintervention assessment, the Living Well group showed significantly greater improvement than the usual-care group on the SF-12 outcome subscales, with effect sizes of .55, .66, and .68, respectively, for the physical functioning, emotional well-being, and general health functioning subscales ($p<.05$ for all). For the Living Well group, scores on all three of the subscales decreased from the postintervention to the follow-up assessment. However, the differences in adjusted means between the two treatment conditions at follow-up were no longer statistically significant.

Attitudinal outcomes. At both postintervention and follow-up, the Living Well group showed improvement as

Table 1

Baseline characteristics of mental health consumers assigned to two treatment conditions[a]

Characteristic	Total (N=63)		Living Well (N=32)		Usual care (N=31)	
	N	%	N	%	N	%
Demographic						
Age	49.5±9.1		46.7±6.7		49.3±11.1	
Male	30	48	14	44	16	52
Race						
Caucasian	18	29	8	25	10	32
Black	42	67	24	75	18	58
Multiple races	3	4	0	—	3	10
Ethnicity						
Hispanic	2	3	2	6	0	—
Non-Hispanic	61	97	30	94	31	100
At least a high school diploma or a GED	37	59	18	56	19	61
Health status and behaviors						
Chronic general medical conditions (M±SD)	2.6±1.5		2.4±1.3		2.8±1.6	
Diabetes	31	49	15	47	16	52
Arthritis	27	43	12	38	15	48
Respiratory disease	25	40	11	34	14	45
Cardiovascular disease	17	27	7	22	10	32
Body mass index	33.7±8.0		33.1±8.0		34.3±8.2	
Current smoker	36	72	21	81	15	63
Alcohol use in past 30 days	16	25	9	28	7	23
Drug use in past 30 days	4	7	2	6	2	7
Health care use						
Has a usual source of care	61	97	31	97	30	97
Provider visits in the past 6 months (M±SD)	2.6±2.4		2.4±1.9		2.9±2.9	

[a] No significant baseline differences were found between groups on any variable.

measured by the Self-Management Self-Efficacy Scale and by the activation level and approach-to-health-care subscales of the Patient Activation Scale, whereas compared with baseline, the usual care group worsened or stayed the same as measured by all three. At postintervention, the Living Well group had significantly higher mean scores than the usual-care group, with effect sizes equal to .65, .55, and .61, respectively, for the three measures ($p<.05$ for all). However, none of these differences remained statistically significant at follow-up. Between the postintervention and follow-up assessments, further improvement was observed for the Living Well group as measured by the internal locus of control subscale of the Multidimensional Health Locus of Control; at follow-up, the Living Well group had significantly higher mean scores than the usual care group (effect size=.66, p=.018). No significant differences between groups were observed on the Recovery Assessment Scale–Short Form at either time point.

Behavioral outcomes. Compared with the usual-care group, the Living Well group showed significant improvement at postintervention on two subscales of the Instrument to Measure Self-Management: general self-management behaviors (effect size=.57, p=.036) and making better use of health care (effect size=.81, p=.004). However, at two-month follow-up only the difference between groups in scores on making better use of health care remained significant (effect size=.54, p=.049). At follow-up, the Living Well group had significantly higher scores than the usual-care group on the physical activity subscale (effect size=.56, p=.048) and the healthy eating subscale (effect size=.64. p=.019), although the differences in postintervention scores were not statistically significant. Finally, no significant differences were observed at either time point for the two remaining self-management subscales (accessing social support and behavioral and cognitive symptom management) or for medication adherence.

Service outcomes. Use of the emergency department in the past six months decreased in the Living Well group: 31% of participants reported such use at baseline, compared with 11% at follow-up. Little change in emergency department use was noted in the usual-care group: 27% at baseline and 28% at follow-up. However, the differences in rates of use were not statistically significant between groups (p=.128).

Attendance and outcomes

We assessed whether attending Living Well sessions was associated with outcomes (data not shown). For each outcome (response variable at posttreatment), an analysis-of-covariance model was fitted, with number of sessions completed as the primary independent variable and with adjustment for baseline score on the outcome. Number of sessions attended was not significantly associated with any of the outcomes. This analysis was conducted only for the Living Well group, and power was therefore limited.

Table 2

Outcomes at postintervention and two-month follow-up of mental health consumers assigned to two treatment conditions[a]

	Baseline				Postintervention								2-month follow-up							
	Living Well (N=32)		Usual care (N=31)		Living Well (N=28)		Usual care (N=30)						Living Well (N=28)		Usual care (N=29)					
Measure and outcome	M	SD	M	SD	M	SD	M	SD	ES[b]	t[c]	df	p	M	SD	M	SD	ES[b]	t[c]	df	p
Functional																				
SF-12[d]																				
General health functioning	42.7	13.5	37.0	12.7	43.0	12.9	34.4	9.0	.68	2.47	50	.017	39.6	12.6	37.0	9.4	−.01	−.03	49	.972
Physical functioning	29.6	10.7	29.3	10.9	33.4	9.5	27.2	13.7	.55	2.10	50	.041	33.3	11.5	30.3	10.9	.31	1.16	48	.250
Emotional well-being	46.6	12.2	44.6	12.7	50.5	11.1	43.2	10.7	.66	2.37	45	.022	46.9	10.7	43.9	11.5	.32	1.14	44	.261
Attitudinal																				
Self-Management Self-Efficacy Scale[e]	6.9	2.1	6.5	1.7	7.4	2.1	5.9	2.3	.65	2.42	50	.019	7.1	2.1	5.9	2.1	.50	1.85	49	.070
Patient Activation Scale[f]																				
Activation level	61.9	14.9	60.1	12.8	65.3	15.7	58.8	13.9	.55	2.08	50	.042	65.5	16.2	60.1	14.2	.33	1.23	49	.226
Approach to health care	40.7	5.4	40.2	4.7	42.0	5.4	39.7	4.7	.61	2.32	50	.025	42.0	5.5	39.9	5.8	.34	1.27	49	.210
Recovery Assessment Scale–Short Form[g]	96.0	13.7	94.1	10.2	97.1	12.3	91.8	10.1	.42	1.53	48	.133	99.4	12.7	94.8	12.1	.19	.71	49	.478
Internal locus of control for health[h]	27.5	5.6	26.9	5.5	28.0	6.4	25.2	6.4	.29	1.06	50	.294	28.9	4.0	25.3	5.9	.66	2.44	49	.018
Instrument to Measure Self-Management[i]																				
General self-management behaviors	2.6	1.5	2.4	1.3	3.3	1.4	2.6	1.3	.57	2.16	50	.036	2.9	1.4	2.3	1.3	.43	1.62	49	.112
Use of health care	2.7	1.2	2.5	1.3	3.0	1.5	2.3	1.1	.81	3.03	50	.004	2.9	1.2	2.2	1.4	.54	2.02	49	.049
Behavioral and cognitive symptom management	1.9	1.1	1.8	.9	2.3	1.0	2.0	1.2	.07	.27	50	.788	1.9	1.0	1.8	1.2	.00	−.01	49	.992
Social support	2.6	1.5	2.8	1.4	2.4	1.0	2.5	1.6	−.03	−.10	50	.919	2.5	1.3	2.5	1.3	.02	.07	49	.944
Physical activity	2.8	1.4	2.3	1.4	3.3	1.4	2.5	1.4	.36	1.30	50	.200	3.2	1.2	2.2	1.4	.56	2.02	49	.048
Healthy eating	2.3	1.2	2.4	1.2	2.4	1.1	2.7	1.5	−.16	−.60	50	.548	2.8	1.0	2.4	1.1	.64	2.42	49	.019
Morisky Medication Adherence Scale[j]	2.5	2.5	3.2	2.3	2.2	2.6	3.6	3.5	−.16	−.56	45	.576	2.6	2.7	3.3	3.0	−.21	−.75	46	.455
Use of emergency department for medical services (N and %)	10	31	8	27									3	11	8	28	.30[k]	2.32[k]	1	.128

[a] Except for emergency department use, mean values are scores. For outcomes across both time points, one significant difference was found favoring groups cofacilitated by a professional and a peer compared with groups led by two peers. The former had greater observed improvement from baseline to postintervention on the general self-management behaviors (t=3.07, df=25, p=.005).

[b] Effect size (ES) calculated as mean difference at posttreatment adjusted for baseline divided by adjusted standard deviation

[c] A chi square test was used for the comparison of emergency department use.

[d] 12-item Short-Form Health Survey. Possible subscale scores range from 0 to 100, with higher scores indicating greater well-being.

[e] Possible scores range from 0 to 10, with higher scores indicating greater confidence.

[f] Possible subscale scores range from 0 to 100, with higher scores indicating greater activation.

[g] Possible scores range from 0 to 25, with higher scores indicating greater recovery.

[h] Measured with a subscale of the Multidimensional Health Locus of Control. Possible scores range from 0 to 36, with higher scores indicating greater internal locus of control.

[i] Possible subscale scores range from 0 to 5, with higher scores indicating greater frequency.

[j] Possible scores range from 0 to 16, with higher scores indicating greater adherence.

[k] Adjusted odds ratio for the rate of emergency department use in the 6 months before the 2-month follow-up (reference: usual care)

Facilitator pairing

For all outcomes listed in Table 2 at both time points, only one significant difference was noted. Compared with the groups led by two peers, the groups led by a professional and a peer showed greater improvement from baseline to postintervention on the subscale measuring general self-management behaviors (t=3.07, df=25, p=.005).

Discussion

Living Well, adapted from the CDSMP and optimized for consumers with serious mental illness, showed benefit in improving a range of attitudinal, behavioral, functional, and service use outcomes. Specifically, at the completion of the intervention Living Well participants experienced significant improvement in physical functioning, emotional well-being, and general health functioning. They also showed significant improvement in self-efficacy and patient activation and in measures of general self-management behaviors and effective use of health care.

A second evaluation was conducted two months later to assess sustainability of effect. During the two months, a booster session was held each month for participants in the Living Well group. Although attenuation of effect was noted in most attitudinal and behavioral outcomes, evidence was found of continued significant improvement in use of general self-management behaviors. Continued advantage for the Living Well group was also noted in other areas, such as health-related locus of control and reports of healthy eating and physical activity; all of these are important for longer-term health management. On the other hand, the attenuation of gains in functional measures suggests that more frequent booster sessions or additional curriculum content focused on longer-term maintenance may be needed to sustain intervention effects. It might also be beneficial to give individuals the opportunity to repeat the curriculum as needed to help support and reinforce self-management skills.

Follow-up data also highlight the intervention's potential to influence service utilization patterns. Receipt of Living Well was associated with a notable decrease in use of the emergency department for medical care, although the association was not statistically significant. The potential cost savings associated with reduced use of emergency services should be evaluated in future studies, as should the intervention's effects on a broader range of health services, including use of primary and specialty medical services and inpatient hospitalization.

It is also worth noting that effective use of health care, including preparing questions for health care providers and discussing medication side effects, was significantly different between groups at both postintervention and follow-up assessments. Although we cannot link any single element in the intervention to the attainment of specific outcomes, the addition of an extra module focused on helping participants communicate more effectively with providers may have contributed to this result.

The similarities between Living Well and the intervention developed by Druss and colleagues (25) underline the importance of understanding the differences between the two efforts. First, group facilitators in the study by Druss and colleagues were exclusively consumers, whereas Living Well allowed for a mix of cofacilitator leadership. Our finding that Living Well groups led by two consumers generally experienced the same benefits as those led by a consumer-professional pair suggests greater flexibility in implementing self-management curricula.

Also, Druss and colleagues' study (25) included participants with a range of mental illnesses recruited from one mental health center, and the investigators made few modifications to the CDSMP structure and content. The Living Well intervention, on the other hand, included additional tailoring of the CDSMP, enrolled a more homogeneous cohort—almost all of whom had a diagnosis of a schizophrenia spectrum disorder—and was evaluated in a community mental health center and three psychiatric day programs. The fact that both studies showed positive results offers promise for using self-management interventions designed for individuals with chronic general medical conditions with a heterogeneous group of mental health consumers receiving services in varied settings.

In addition, our evaluation of Living Well included assessment of outcomes immediately after completion of the weekly intervention and at a more distal follow-up, which afforded us an opportunity to examine sustainability of effect supported by delivery of two booster-review sessions; the study by Druss and colleagues (25) assessed outcomes only at six months postbaseline, several weeks after participants completed the weekly intervention and without booster-review sessions. Additional work is needed to determine whether and to what extent booster-review sessions help participants maintain self-management skills.

It is important to note that both studies had limitations, including relatively small samples that may have limited power, reliance on self-report measures, and a relatively brief follow-up period, particularly in regard to the assessment of medical service utilization. In our study, enrollment of a somewhat limited number of participants, relative to the potential pool of eligible consumers, may have limited the generalizability of findings. Also, because of the number of comparisons made and the noted attenuation of effects measured two months after completion of the intervention, caution is indicated in interpreting the robustness of the findings of this pilot study.

Nonetheless, our findings in combination with those of Druss and colleagues contribute to a developing evidence base supporting the efficacy of recovery-oriented self-management interventions for chronic general medical illness for consumers with serious mental illness. Further evaluation of Living Well and other programs is needed, including larger effectiveness trials. Researchers conducting such trials may also want to include measures of disease-specific health outcomes related to chronic illnesses that are common among consumers with serious mental illness. Also needed are studies that identify factors that may improve dissemination and sustainability of Living Well and other

promising interventions. Attention to the identification and training of mental health consumers as peer leaders will be especially important to advance the evidence supporting the use of peer providers.

Conclusions

Living Well shows promise in helping consumers of mental health services with serious mental illness more effectively manage chronic general medical conditions and experience improved functioning and well-being.

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