Published in final edited form as:
Psychiatr Serv. 2019 January 01; 70(1): 19–25. doi:10.1176/appi.ps.201800162.

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

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Abstract

Previous presentation:
This data was partially presented at the 2017 American Psychological Association annual convention in Washington, D.C., on August 3, 2017.

Objective: Many adults with serious mental illness exhibit significant medical illness burden and poor illness self-management. The present study examined Living Well, a group-based illness self-management intervention for adults with serious mental illness, co-facilitated by two providers, one who has lived experience with co-occurring mental health and medical conditions.

Methods: Adults with serious mental illness (N=242) were randomized to Living Well or an active control. Participants completed assessments of quality of life, health attitudes, self-management behaviors, and symptoms at baseline, post-treatment, and follow-up. Emergency room use was assessed via chart review. Mixed effects models examined group by time interactions on outcomes.

Results: In Living Well, compared to the control, there were greater improvements at post-treatment in mental health related quality of life (t=2.15, df=619, p=.032), self-management self-efficacy (t=4.10, df=622, p<.0001), patient activation (t=2.08, df=622, p=.038), internal health locus of control (t=2.01, df=622, p=.045), behavioral/cognitive symptom management (t=2.77, df=620, p=.006), and overall psychiatric symptoms (t=−2.02, df=603, p=.044), and at follow-up in physical activity related self-management (t=2.55, df=620, p=.011) and relationship quality (t=−2.45, df=603, p=.015). There were no effects on emergency room use (t=0.47, df=480, p=.640). The control group exhibited greater increases in physical health related quality of life at post-treatment (t=−2.23, df=619, p=.026). Significant group differences in self-management self-efficacy (t=2.86, df=622, 0.004) and behavioral/cognitive symptom management (t=2.08, df=620, 0.038) were maintained at follow-up.

Conclusions: Compared to an active control, a peer co-facilitated illness self-management group was effective for improving quality of life and self-management self-efficacy in adults with serious mental illness.

Individuals with serious mental illness (schizophrenia, schizoaffective disorder, major depression, and posttraumatic stress disorder) have a reduced life expectancy compared to the general population, due to elevated rates of chronic medical conditions such as diabetes and cardiovascular and respiratory disease (1,2,3,4). Poor self-management of chronic medical conditions among this group exacerbates medical illness course (5). Strategies to improve illness self-management among individuals with serious mental illness and co-occurring medical conditions are needed (6).

Peer interventions for illness self-management are led by individuals who themselves are managing a chronic medical condition who can provide effective models. One such intervention with established efficacy is the Chronic Disease Self-Management Program (CDSMP), which consists of six peer-led group sessions, 2-2.5 hours each, focused on goal-setting and problem solving (7). A growing workforce of peer specialists with a lived experience of mental illness could be employed to promote illness self-management among adults with serious mental illness (8).

Four studies have examined CDSMP for individuals with serious mental illness. In a non-randomized pre-post intervention study, Lorig and colleagues (9) trained certified peer providers working at community mental health centers in CDSMP; survey data indicated improvements in numerous health indicators. Druss and colleagues (10) adapted CDSMP for individuals with serious mental illness, creating the Health and Recovery Peer Program

(HARP), which consists of six 2.5 hour sessions. HARP has been tested in two RCT's (10,11) with positive results; in the second RCT (n=400), HARP was associated with significant improvements in physical and mental health related quality of life and mental health recovery (11).

Living Well (12) is also based on the CDSMP, but was substantially revised in content/ structure for ease of implementation with consumers with serious mental illness in outpatient mental health settings (e.g., shorter sessions, twelve sessions instead of six, repetition of material, option for co-facilitation by a peer and non-peer). In a pilot RCT (n=63), compared to usual care, Living Well was associated with significant improvements in self-efficacy, patient activation, illness self-management behaviors, and health-related quality of life at post-intervention. Notably, the Lorig (9) study was uncontrolled, while the Druss (10,11) and Goldberg (12) studies utilized a usual care control condition. Thus, while a growing literature supports the use of the CDSMP model with individuals with serious mental illness, a large RCT with an active control condition is lacking. Moreover, the CDSMP model has not been tested among Veterans with serious mental illness; given that Veterans on average have poorer health than non-Veterans (13), this is a significant gap.

The present study aimed to conduct a large RCT comparing Living Well, a 12-session group intervention co-led by a Veteran peer with co-occurring mental and physical health disorders and a non-peer facilitator, to 12 sessions of a didactic medical illness education and support group led by a non-peer facilitator. Active ingredients of the Living Well intervention which were not present in the control condition were: a peer facilitator, skills training in goal-setting, action planning, and problem-solving, the setting of weekly health goals, and positive reinforcement of small steps towards health goals. We hypothesized that participants in the Living Well intervention would exhibit greater improvements in physical and mental health related quality of life (primary outcome), self-efficacy, patient activation, and illness self-management behaviors, and greater decreases in emergency room use, compared with the active control condition, at post-treatment and three-month follow-up.

Method

Participants and Procedures

Participants were recruited from outpatient programs at three VA Medical Centers in the Mid-Atlantic region – two urban, one rural – between January 2014 and April 2016. Potential participants were identified by chart review, clinician referral and self-referral. Inclusion criteria were: (1) a chart diagnosis of schizophrenia spectrum disorder, bipolar disorder, major depression with psychotic features, or PTSD, (2) chart diagnosis of a chronic respiratory or cardiovascular condition, diabetes, or arthritis, (3) engagement in mental health services at a study site, (4) capacity to consent, and (5) approval from the participant's mental health provider. Exclusion criteria included serious cognitive impairment or participation in a concurrent psychosocial treatment trial at the investigators' home research center.

All study procedures were approved by the appropriate Institutional Review Boards. Interested and eligible participants completed written informed consent. Eligible consented

participants completed baseline assessments and were then randomized. Assessors were Masters level research assistants who received thorough training on all assessment measures, including intensive in-person training overseen by the PI (RWG), repeated observation and feedback on assessments, and ongoing supervision.

Among potential participants approached, there was no difference in proportion randomized in terms of gender or ethnicity; in terms of race, African-Americans were more likely to be randomized (29%) than Whites (19%; Chi-square = 29.5, df=2, p<001). See online supplement for CONSORT diagram describing participant recruitment/randomization. Assessment measures were repeated post-treatment (3 months post-baseline), and follow-up (6 months post-baseline). Assessors were blind to treatment condition.

Interventions

Peer and non-peer group facilitators of both conditions were trained and supervised by the study PI (RWG) in weekly supervision sessions. Group sessions for both conditions were videorecorded for fidelity.

Living Well is a manualized 12-session group intervention designed to enhance self-efficacy and motivation through education and skills training in action planning and problem-solving. Group sessions are 75 minutes in length. A range of health-related topics are covered (e.g., healthy eating, physical activity, medication management, symptom management, and making good use of health care). Participants create weekly action plans related to each topic, report on progress on previous action plans, and engage in group-based problem solving to overcome barriers to completing action plans. Peer providers completed weekly check-in calls with participants to provide problem-solving around action plans. All groups were co-facilitated by a non-peer provider (generally a research assistant with a Masters in Clinical or Counseling Psychology – approximately the equivalent of a Masters-level clinician) and a Veteran peer provider who had lived experience with co-occurring mental health and medical conditions. Group leadership was shared equally by peer and non-peer facilitators. Both facilitators presented didactic information, aided participants in weekly goal-setting and action planning, and helped facilitate problem-solving. The peer facilitator additionally engaged in self-disclosure regarding his/her own illness self-management, as relevant to session material and participant experiences.

The Medical Illness Education and Support group was a manualized 12-session intervention focused on living with a chronic medical condition. Sessions included standardized didactic review of common challenges experienced by those living with chronic medical illness. Sessions were of similar length and frequency as Living Well. Groups were facilitated by a single non-peer facilitator.

Measures

Basic demographic and psychosocial information was collected from participants. Current and lifetime medical conditions were solicited based on interview items from the National Health and Nutrition Examination Survey III (14). Physical and mental health related quality of life was assessed using the 12-item Short-Form Health Survey (SF-12; 15), a widely used instrument with good psychometrics in this population (16). To assess attitudinal change

several measures with strong psychometric properties were used: the 6-item Self-Management Self-Efficacy scale (SSE-6), based on a measure used in the original CDSMP evaluation (17), the activation-level subscale of the Patient Activation Measure (PAM; 18), which measures self-reported ability to actively participate in treatment encounters, and the 6-item Internal Health Locus of Control (IHLC) subscale of the Multidimensional Health Locus of Control scale (19), which measures self-perceived control over one's health.

The Instrument to Measure Self-Management (IMSM; 17), based on a measure used in the original CDSMP evaluation, was used to assess change in specific and general self-management behaviors, and the Morisky Medication Adherence Scale (MMA; 20) a self-report scale with good psychometric properties (20), was used to assess medication adherence.

To assess psychiatric symptoms and recovery, the Behavior and Symptom Identification Scale 24 – Modified (BASIS; 21), a self-report measure of mental health symptoms with well-established psychometric properties, and the Maryland Assessment of Recovery Scale (MARS), a 25-item self-report measure of recovery orientation with good internal consistency and test-retest reliability (22), were used.

Emergency room use was extracted from the electronic medical record for the six months prior to baseline and the six months of the study duration. The ER visit outcome was coded as binary, indicating whether the individual had an ER visit focused on a medical issue during each of the six month timeframes.

Data Analysis

For continuous scale outcomes linear mixed effects models were used to test the effectiveness of Living Well compared to Medical Illness Education and Support. A random effect for class accounted for intra-class correlation due to common group membership. Within-individual correlation among measurements over-time was accounted for with an unstructured error correlation matrix. Regression terms in the model included intervention, time, and intervention-by-time interactions. Time was entered into the model using two dummy variables – one for post-treatment and one for the follow-up time point in order to compare group mean change from baseline to post-treatment separately from baseline to follow-up. The interaction terms estimated mean change in Living Well minus mean change in the control group. All available outcome measure data from baseline, post-treatment, and follow-up were included (intent-to-treat). All continuous outcome scales were checked for skew and an appropriate transformation was applied as needed.

For the ER visit (yes/no) outcome, a logistic mixed effect model for binary outcome was used. This model was specified parallel to the above linear model. However, the interaction term in this model estimated the difference in change in proportion with an ER visit from the baseline six-month period to the follow-up six-month period between the intervention groups on a log-odds scale. A negative coefficient estimate represents a reduction in Living Well relative to the control condition.

Statistical significance was defined as $p < .05$. All analyses were performed using SAS version 9.4.

Results

Intervention Attendance and Fidelity

Living Well participants attended a mean of 5.4 +/− 4.4 out of 12 weekly sessions, while Medical Illness Education and Support participants attended a mean of 6.4 +/− 4.2 out of 12 weekly sessions. In the Living Well condition, 99(79.8%) participants attended at least one group session, and 65 (52.4%) attended at least five group sessions. In the Medical Illness Education and Support condition, 100 participants (84.7%) attended at least one group session, and 76 (64.4%) attended at least five group sessions. Living Well participants were offered 3 monthly booster sessions after the 12-week curriculum, and attended a mean of 0.8 +/− 1.1 booster sessions, with the majority of participants (n=74, 59.7%) not attending any booster sessions.

A total of 30 Living Well sessions and 18 Medical Illness and Support sessions were rated on facilitator competence and adherence to content by independent reviewers. Each item was scored on a three point scale (0=unacceptable, 1=acceptable, and 2=excellent). Across the 30 recorded Living Well sessions, the full curriculum and all possible facilitator pairings were represented at least once. Mean scores were high in both Living Well (adherence=1.99 and competence=1.98) and Medical Illness and Support (adherence=1.97 and competence=1.95), no rated sessions included any “unacceptable” ratings.

Outcomes

Treatment outcomes by group are displayed in Table 2. There were no group differences on SF-12 General Health Functioning. Living Well participants exhibited greater increases on the SF-12 Mental Health Composite, and Medical Illness Education and Support participants exhibited greater increases on the SF-12 Physical Health Composite, at post-treatment but not follow-up. Participants in Living Well showed greater improvement in SSE-6 at post-treatment and follow-up, and greater increases on IHLC and the PAM activation-level subscale at post-treatment, but not follow-up. Participants in Living Well showed greater improvement on the IMSM-Behavioral and Cognitive Symptom Management subscale at post-treatment and follow-up, and greater improvement on the IMSM- Physical Activity scale at follow-up but not post-treatment, indicating a delayed effect. There were no other significant group differences on the IMSM scale and no group differences on the MMA.

Living Well was associated with a greater decrease in BASIS overall symptoms at post-treatment, but not follow-up, and delayed improvement on the BASIS Relationships subscale at follow-up. There were no other significant group differences on BASIS scales. There was a non-significant trend for greater improvement on the MARS among Living Well participants at post-treatment, but not follow-up. There were no group differences in ER use at any time point.

Discussion

In a large, well-controlled RCT, participation in Living Well, a medical illness self-management intervention for individuals with serious mental illness co-led by a peer and non-peer facilitator, resulted in significant improvements to mental health but not physical health related quality of life immediately post-treatment, as well as improvement in self-efficacy and behavioral/cognitive symptom management at both post-treatment and follow-up, compared to participation in an active control condition, a didactic medical illness and support group. Also compared to the control condition, Living Well was associated with improved patient activation, psychiatric symptoms, quality of social relationships, and physical activity related self-management.

Living Well had a large effect on self-efficacy, which was maintained at follow-up. Adults with serious mental illness often have poor self-efficacy for health behaviors (23), which may result from limited exposure to role models and social support for wellness (24). Using a peer facilitator and a group-based format, Living Well provided credible sources of social support for health behaviors, which may have been a key ingredient in enhancing illness management self-efficacy. Illness management self-efficacy, in turn, may have led to increased self-management behaviors (i.e., behavioral/cognitive symptom management, physical activity related self-management).

At post-treatment, participants in Living Well exhibited improvements across health attitudes, behavioral/cognitive symptom management, psychiatric symptoms, and mental health related quality of life. At follow-up, Living Well was associated with improvements in interpersonal relationships. While a mediation model was not tested here, it may be that Living Well helped participants feel empowered to engage in symptom management behaviors, which were then associated with a decrease in mental health symptoms and an improvement in relationship quality and mental health functioning. The majority of these outcomes were significant at post-treatment and not maintained at follow-up, indicating that a longer intervention with more intensive strategies for maintenance and generalization may be warranted.

Among Living Well participants, while use of behavioral or cognitive stress management strategies improved at post-treatment, self-management of physical activity did not increase until three-month follow-up. It may be that individuals with serious mental illness implement stress management strategies initially because this is an area of more immediate need or because these strategies may be the easiest for them to internalize because of previous exposure in their mental health treatment. If Living Well were to be expanded to a longer intervention, one might focus in the first several weeks on stress management before shifting to a focus on other health behaviors.

The only outcome which exhibited greater improvement in the Medical Illness Education and Support group was physical health related quality of life, which was not maintained at three-month follow-up. It may be that in order to impact physical health outcomes, an exclusive focus on physical health topics is required. Alternatively, it may be that for Living Well to impact physical health related quality of life, a longer intervention may be required

to allow for attitudinal and behavioral changes to have eventual downstream impacts. Of note, the delay in physical activity change may mean that related changes to physical health quality of life would occur after the three-month time point; future studies with longer follow-up periods should explore this possibility.

While several findings indicate that delivering Living Well over a longer time period might be necessary to promote maintenance and generalization, it is possible that the intervention could be less intensive and still be effective. Living Well required a significant time commitment (attendance at 12 weekly face-to-face sessions) which may have contributed to the approximately 75% of potential participants who were contacted and declined to participate in the intervention. Among those who did consent, the level of attendance varied widely, with half of participants attending four or fewer sessions. Despite this, Living Well was associated with better short-term outcomes across a number of measures than the active control. This indicates that exposure to all of the intervention content was not necessary for positive outcomes; thus the active ingredients of Living Well (peer contact, skills training in goal-setting, action planning, and problem-solving, weekly goal-setting, and reinforcement of small steps towards health goals) could be delivered in a more condensed and easily accessible format, promoting more widespread participation. For example, there is a growing evidence base for web- and app-based health and wellness interventions, supplemented with peer coaching support, for individuals with serious mental illness (25,26,27). Future studies should examine innovative ways to package and deliver Living Well to maximize accessibility, efficacy, and generalization.

Living Well did not impact ER use. Notably, the rate of ER use in the sample was considerable, which speaks to the medical illness burden in this population, as well as barriers to their engaging proactively in health care. It is possible that a psychosocial group intervention such as Living Well is not enough to address this problem, which may be more attributable to health care systems issues.. It is possible that an intervention which directly connects individuals with serious mental illness to preventive health care is needed to address their high levels of ER use.

The large sample size, recruitment of a Veteran population with significant illness burden, and active control condition were considerable strengths of this study. Limitations included the fact that many of the outcome measures were based on self-report, the follow-up period was relatively brief, and the population was a majority male population who was engaged in mental health services which could limit generalizability. In addition, attendance of intervention sessions was sporadic, with half of participants attending four or fewer sessions; future studies should examine the optimal dose of the intervention required to achieve a positive benefit. Nonetheless, our findings support the use of a peer co-facilitated psychosocial intervention to promote self-efficacy, patient activation, and other health attitudes, increase some illness self-management behaviors, attenuate psychiatric symptoms, and improve mental health related quality of life in the short term. Future studies should examine strategies to maintain and generalize gains over a longer period, and examine augmenting Living Well with direct provision of preventive health care.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Disclosures and Acknowledgments:

The authors have no conflicts of interest to disclose.

This research was supported by the VA Health Services Research and Development Service (IIR 11-216; Dr. Goldberg, principal investigator), the VA Rehabilitation Research and Development Service (CDA IK2RX002339; Dr. Muralidharan, principal investigator and CDA 1IK2RX001836, Dr. Klingaman, principal investigator), and the VISN 5 MIRECC. In loving memory of Valerie Price, B.A., Peer Support Specialist, whom we gratefully acknowledge for her critical role in the original development of the Living Well intervention.

The views expressed in this article are those of the authors and do not necessarily reflect the position or policy of the VA, the U.S. government, or other affiliated institutions.

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Table 1.

Participant demographics, health status, and health care use by treatment group[a]

	Total (N=242)		Living Well (N=124)		Education/ Support (N=118)	
	n	%	n	%	n	%
Demographics						
Age	57.8 +/−7.7		58.5+/−7.6		57.0 +/−7.8	
Male	210	87	107	86	103	87
Race						
Caucasian	69	29	31	25	38	32
Black	151	62	82	66	69	59
Other/Multiple races	22	9	11	9	11	9
Ethnicity						
Hispanic	5	2	4	3	1	1
Non-Hispanic	235	98	118	97	117	99
At least a high school diploma or a GED	225	93	114	92	111	94
Psychiatric diagnosis[b]						
Schizophrenia	29	12	14	11	15	13
Schizoaffective disorder	38	16	23	19	15	13
Bipolar disorder	86	35	39	32	47	40
Major Depression Disorder with Psychotic Features	12	5	7	6	5	4
Psychosis NOS	12	5	8	7	4	3
Post-Traumatic Stress Disorder	71	29	38	31	33	28
Health Status and Behaviors[c]						
Number of classes of chronic medical conditions	3.4+/−1.7		3.3+/−1.7		3.4=/−1.6	
Diabetes	91	38	50	40	41	35
Arthritis	187	77	94	76	93	79
Respiratory Diseases	27	11	16	13	11	9
Cardiovascular Diseases	36	15	18	15	18	15
Body mass index	31.1 +/−6.5		31.1+/−6.2		31.0 +/−6.7	
Current Smoker	94	43	45	41	49	45
Alcohol use in past 30 days	63	28	28	25	35	32
Drug use in past 30 days	19	9	8	7	11	10
Health Care Use						
Has a usual source of medical care	220	99	111	98	109	99

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

[b]Participants could have more than one psychiatric diagnosis.

[c]Self-reported conditions participants endorsed “still having” at time of baseline assessment.

Table 2.

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

	Baseline		Post-intervention						3-month follow-up					
	Living Well (N=124)	Education/ Support (N=118)	Living Well (N=105)	Education/ Support (N=107)					Living Well (N=106)	Education/ Support (N=104)				
Measure and outcome	**M ± SD**	**M ± SD**	**M ± SD**	**M ± SD**	**ES[b]**	**t**	**df**	**p**	**M ± SD**	**M ± SD**	**ES[b]**	**t**	**df**	**p**
Functional														
SF-12[c]														
General Health Functioning	40.4 ± 12.0	38.9 ± 12.5	42.5 ± 11.3	41.6 ± 12.2	−0.11	−0.91	622	0.362	42.9 ± 12.0	39.2 ± 12.2	0.18	1.47	622	0.142
Physical Health Composite	39.2 ± 10.4	38.6 ± 11.4	39.0 ± 10.3	40.2 ± 11.3	−0.21	−2.23	619	0.026	40.3 ± 10.2	38.4 ± 12.3	0.10	0.95	619	0.342
Mental Health Composite	41.3 ± 11.9	40.7 ± 11.5	44.0 ± 11.4	40.5 ± 11.6	0.24	2.15	619	0.032	42.7 ± 11.5	41.5 ± 12.2	0.07	0.58	619	0.563
Health attitudes														
Self-Management Self-Efficacy scale[d]	5.5 ± 2.1	5.5 ± 2.0	6.2 ± 1.9	5.4 ± 2.1	0.43	4.10	622	<.0001	6.0 ± 2.0	5.4 ± 2.0	0.32	2.86	622	0.004
Patient Activation Measure[e]-activation level subscale	60.8 ± 15.2	58.8 ± 14.6	64.3 ± 14.0	58.9 ± 14.3	0.21	2.08	622	0.038	63.4 ± 14.6	60.5 ± 16.1	0.04	0.35	622	0.727
Internal Health Locus of Control[f]	26.4 ± 5.9	26.1 ± 5.9	27.0 ± 4.8	25.5 ± 6.3	0.23	2.01	622	0.045	26.6 ± 5.4	25.7 ± 5.5	0.11	1.07	622	0.285
Behavioral														
Instrument to Measure Self Management[g]														
General self-management behaviors	2.7 ± 1.1	2.3 ± 1.2	2.9 ± 1.2	2.6 ± 1.2	−0.09	−0.61	620	0.544	2.9 ± 1.2	2.5 ± 1.2	0.11	0.76	620	0.446
Use of health care	2.9 ± 1.4	2.5 ± 1.4	3.3 ± 1.2	2.9 ± 1.3	−0.04	−0.39	620	0.699	3.3 ± 1.3	3.0 ± 1.3	−0.07	−0.74	620	0.459
Behavioral and cognitive symptom management	2.2 ± 1.1	2.2 ± 1.0	2.5 ± 1.0	2.2 ± 0.9	0.29	2.77	620	0.006	2.5 ± 1.1	2.3 ± 0.9	0.22	2.08	620	0.038
Social support	2.3 ± 1.4	2.3 ± 1.2	2.4 ± 1.3	2.4 ± 1.3	−0.04	−0.30	620	0.762	2.2 ± 1.3	2.3 ± 1.3	−0.15	−1.18	620	0.238
Physical activity	2.3 ± 1.3	2.3 ± 1.3	2.7 ± 1.3	2.4 ± 1.3	0.12	0.98	620	0.326	2.8 ± 1.3	2.2 ± 1.3	0.29	2.55	620	0.011
Health eating	2.6 ± 1.3	2.5 ± 1.3	3.0 ± 1.1	2.7 ± 1.1	0.04	0.43	620	0.667	2.9 ± 1.1	2.8 ± 1.2	−0.05	−0.37	620	0.709
Morisky Medication Adherence Scale[h]	1.4 ± 1.0	1.5 ± 0.8	1.2 ± 1.0	1.5 ± 0.9	−0.19	−1.50	622	0.134	1.2 ± 1.0	1.4 ± 0.9	−0.02	−0.19	622	0.852
Symptoms and recovery														
BASIS-24[i]														

	Baseline		Post-intervention						3-month follow-up					
	Living Well (N=124)	Education/ Support (N=118)	Living Well (N=105)	Education/ Support (N=107)					Living Well (N=106)	Education/ Support (N=104)				
Measure and outcome	**M ± SD**	**M ± SD**	**M ± SD**	**M ± SD**	**ES[b]**	**t**	**df**	**p**	**M ± SD**	**M ± SD**	**ES[b]**	**t**	**df**	**p**
Overall	1.6 ± 0.8	1.6 ± 0.8	1.4 ± 0.7	1.6 ± 0.8	−0.23	−2.02	603	0.044	1.4 ± 0.7	1.6 ± 0.7	−0.17	−1.40	603	0.162
Depression	1.6 ± 0.9	1.7 ± 0.9	1.5 ± 0.8	1.7 ± 0.9	−0.23	−1.86	603	0.063	1.5 ± 0.8	1.7 ± 0.9	−0.13	−1.03	603	0.304
Relationships	1.6 ± 1.0	1.5 ± 0.9	1.5 ± 1.0	1.5 ± 0.8	−0.18	−1.62	603	0.106	1.5 ± 1.1	1.7 ± 0.9	−0.32	−2.45	603	0.015
Psychosis	0.9 ± 0.7	1.0 ± 0.6	0.8 ± 0.7	0.9 ± 0.6	−0.08	−0.79	603	0.430	0.8 ± 0.6	0.9 ± 0.6	−0.05	−0.50	603	0.619
Maryland Assessment of Recovery Scale[j]	3.9 ± 0.7	3.8 ± 0.7	4.0 ± 0.7	3.8 ± 0.7	0.16	1.65	622	0.099	4.0 ± 0.7	3.8 ± 0.7	0.12	1.22	622	0.222
Emergency room visits (medical)	49(39.5%)	45(38.1%)							47(37.9%)	48(40.7%)	−0.17[k]	0.47	480	0.640

[a] Mean values are scores.

[b] Effect size (ES) calculated as group-by-time interaction divided by raw standard deviation at baseline.

[c] 12-item Short-Form Health Survey. Possible subscale scores range from 0 to 100, with higher scores indicating greater quality of life

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

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

[f] 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.

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

[h] Possible scores range from 0 to 16, with higher scores indicating greater adherence. The distribution was skewed so a square root transformation was applied before analysis.

[i] Behavior and Symptom Identification Scale 24 – Modified. Possible scores range from 0 to 4. BASIS psychosis was skewed so a square root transformation was applied before analysis.

[j] Possible subscale scores range from 0 to 5.

[k] Change in proportion with an ER visit in the treatment group minus change in the proportion in the control group on a log-odds scale. Negative estimate indicates greater observed reduction in the Living Well group versus the control group.