

Psychiatric Symptoms Moderate the Effects of Mental Illness Self-management in a Randomized Controlled Trial

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Abstract: Depression has been shown to moderate the effects of physical illness self-management (ISM) programs. We attempted to replicate these findings for a mental ISM intervention. Outpatients with serious mental illness ($N = 428$) from eight Tennessee communities were randomly assigned to receive a peer-led self-management intervention called Building Recovery of Individual Dreams and Goals Through Education and Support or services as usual. Psychiatric symptoms were assessed with the Brief Symptom Inventory; the outcome of personal empowerment was measured by the Empowerment Scale. Intent-to-treat analysis using mixed-effects random regression found significant interaction effects between study condition and three moderating symptom profiles. Empowerment was greater for the intervention participants with high levels of depressive symptoms, anxiety symptoms, and general symptom distress than for the experimental participants with low symptom levels and the control subjects with high or low levels of symptoms. These results shed light on how mental ISM programs operate and ways these can be improved.

Key Words: Illness self-management, recovery education, peer-led education.

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The importance of illness self-management (ISM) programs has been documented for patients with chronic medical conditions such as hypertension, cancer, and arthritis (Bodenheimer et al., 2002; Lepore et al., 2003). These interventions help patients assume an active role in managing illnesses by imparting knowledge, teaching communication skills, and providing social support. Positive results include gains in illness-specific knowledge, enhanced patient self-efficacy, improved medical outcomes, and better quality of life (Griffiths et al., 2007; Helgeson et al., 2006; Lorig et al., 1998, 1999).

Recently, ISM interventions have been found to be effective for people with chronic psychiatric conditions such as schizophrenia, depression, and bipolar disorders (Anzai et al., 2002; Mueser et al., 2002; Salyers et al., 2009). When created and led by peers with mental illness, these interventions offer the additional advantage of role models who demonstrate recovery success and impart a sense of hopefulness (Peebles et al., 2007; Salzer and Shear, 2002). Randomized controlled trial (RCT) studies find that these programs produce positive outcomes such as personal empowerment, enhanced quality of life, hope for the future, and ability to advocate for oneself with medical providers (Cook et al., 2011; Druss et al., 2010; Jonikas et al., 2013; Pickett et al., 2012). However, research to date has not examined these interventions' effectiveness for different participant subgroups.

Studies of ISM interventions for medical conditions have identified moderating effects on a variety of program outcomes, the

most common moderator being participants' level of depressive symptoms. Here, participants with higher levels of depression are found to benefit more from ISM than those with lower levels of depression (Harrison et al., 2012). This may be because the group context of ISM imparts therapeutic benefits for those who are severely depressed by improving self-esteem and reducing social isolation, leading to enhanced health outcomes relative to those achieved by nondepressed or less depressed participants (Harrison et al., 2011). An RCT of ISM for patients with multiple chronic illnesses found that intervention participants with greater depressive symptom severity experienced greater gains in illness management self-efficacy than those with lower depressive symptom severity and controls with high or low depressive symptoms (Jerant et al., 2008). In their RCT of an ISM intervention for macular degeneration, Brody et al. (2002) found a three-way interaction indicating that depressed patients who received the intervention reported significant increases in both function and mood over time compared with nondepressed experimental subjects as well as depressed and nondepressed controls. An RCT of an ISM program for men with prostate cancer found that intervention participants with higher levels of depressive symptoms experienced greater improvement in self-esteem and prostate-specific functioning than nondepressed experimental subjects and controls (Helgeson et al., 2006). Finally, secondary analysis of data from an RCT testing self-management for multiple conditions found that depression moderated the intervention's treatment effect on outcomes such as vitality and health-related quality of life (Harrison et al., 2012).

Symptoms of anxiety and even generalized emotional distress have also been found to moderate the effectiveness of ISM interventions (Dowson et al., 2004). This may be because individuals with some level of anxiety about their illness are more motivated to acquire health information, accurately recall it, and adhere to suggested treatment to avoid feared outcomes such as hospitalization (Beck and Clark, 1997; Hadjistavropoulos et al., 1998). Among adolescents with inflammatory bowel disease (IBD), anxiety has been found to moderate the relationship between self-assessed barriers to treatment adherence and actual adherence to IBD medication (Gray et al., 2011). In another study, compared with patients with multiple sclerosis and low anxiety, those with higher levels of anxiety were more likely to attend ISM classes (Barlow et al., 2009). In addition, compared with those with low anxiety, patients with high levels of anxiety are significantly more likely to use medical services versus, presumably, self-managing their chronic conditions (Kim et al., 2000). Finally, among patients with chronic medical conditions, affective distress moderated the impact of beliefs about treatment effectiveness on adherence; here, those with greater affective distress who believed in treatment effectiveness had higher adherence to treatment, whereas those with less affective distress did not (Held, 2011).

Our study was designed to replicate the research on moderators of treatment effect for ISM interventions targeting chronic physical illnesses. We wanted to determine whether depression, anxiety, and general symptom distress also moderate the effects of an ISM program for people with psychiatric disorders. Our outcome of focus was personal empowerment, a common dependent variable in evaluations of mental health ISM (Cook et al., 2012a,b; Salyers et al.,

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2007; Young et al., 2000). Empowerment is a multidimensional construct that encompasses the notion of psychological empowerment involving the connection between individuals' self-perceived competence and their desire for and willingness to take action in the public sphere (Rappaport, 1987; Zimmerman and Rappaport, 1988). It also includes the process by which disempowered individuals gain control over their lives and acquire the capabilities to act on their own behalf (Segal et al., 1993).

We tested three potential moderating variables based on prior studies: a) depressive symptoms, b) anxiety symptoms, and c) general symptom distress. We hypothesized that mental health ISM participants with high levels of each type of symptoms would experience greater gains in empowerment than participants with low levels of symptoms as well as controls with both high and low symptom levels.

METHODS

Building Recovery of Individual Dreams and Goals Through Education and Support Intervention

The Building Recovery of Individual Dreams and Goals Through Education and Support (BRIDGES) program was created collaboratively by mental health service users (called consumers) and staff from the National Alliance on Mental Illness of Tennessee (NAMI-TN), the Tennessee Mental Health Consumers Association (TMHCA), and the Tennessee Department of Mental Health and Developmental Disabilities (Diehl and Baxter, 2001; Diehl et al., 2006). Course topics include recovery principles, structured problem-solving and communication skills training, strategies for enhancing support networks and accessing community support systems, brain biology and the operation of psychiatric medications, diagnoses, traditional and nontraditional treatments of serious mental illness (SMI), relapse prevention and coping skills, and independent living skills such as job readiness and assertiveness training. Instructional modalities include group discussion and structured exercises to teach practical application of information and newly acquired skills.

The BRIDGES intervention is designed to influence each of the dimensions that make up the construct of empowerment. First, BRIDGES activities explicitly focus on self-esteem enhancement and encouraging participants to believe that they are capable of engaging in actions that will allow them to manage their mental illness successfully. Second, BRIDGES helps participants reconnect with their personal power to make choices and to resist the disempowering effects of the mental health treatment system. Third, BRIDGES explicitly encourages participants to engage in community activism by introducing them to mental health advocacy and discussing their ability to promote social change. It also enhances participants' sense of autonomy and independence in relation to family and service providers. Fourth, BRIDGES encourages participants' optimism about their ability to recover and stresses that they can exercise control over their lives by engaging in structured problem solving and advance crisis management. Finally, BRIDGES helps people deal with anger and conflict by teaching them to distinguish between aggressive versus assertive communication and encouraging them to use self-advocacy strategies that preserve their rights without infringing on the rights of others.

Study Background

We randomly assigned the participants to either immediate enrollment in the BRIDGES course (intervention group) or a wait-list control condition in which the participants received services as usual (control group). Study sites were public mental health agencies in eight locations representing urban, suburban, and rural areas of Tennessee. All research procedures were approved by the University of Illinois at Chicago (UIC) institutional review board, and all participants provided written informed consent. This study was registered at ClinicalTrials.gov (NCT01297985).

Partners in our project were the TMHCA and the NAMI-TN. Representatives from each organization worked together to coordinate the study locally, which involved study recruitment, monitoring fidelity to the BRIDGES intervention, and maintaining quality control. The participants were recruited from community mental health centers, residential programs, self-help groups, and peer-run programs between March 2007 and March 2009. Individuals were eligible if they were 18 years or older, were enrolled in a publicly-funded SMI treatment program, and/or scored 13 or higher on the K-6 Screening Scale for SMI (Kessler et al., 2003); were willing and able to provide informed consent; were able to understand spoken English; and had not taken the BRIDGES course previously. All participants met criteria for SMI as defined by federal Public Law 102-321 regarding diagnosis, duration, and level of disability (Epstein et al., 2002). A detailed description of recruitment activities has been reported elsewhere (Cook et al., 2011).

Randomization and Assessments

The UIC Survey Research Laboratory (SRL) conducted 60-minute structured telephone interviews using Computer Assisted Personal Interviewing (CAPI) software. Baseline (T1) interviews were administered during the 6-week period before the start of BRIDGES classes. Time 2 (T2) interviews occurred during the 6-week period after the classes ended. Time 3 (T3) assessments were administered at 6 months after T2. Random assignment occurred immediately after the baseline interview using block randomization stratified by site to ensure that the number of participants assigned to each condition was as close to equal as possible (Doig and Simpson, 2005). A random allocation sequence was programmed into the CAPI software to ensure allocation concealment until the point of assignment (Bellg et al., 2004). At T2 and T3, interviewers were blind to the subjects' study condition assignment. At the end of each interview, SRL staff reported whether the subjects had revealed their study condition assignments during the interview. Analysis of these reports showed that this occurred in only 7% of T2 and T3 interviews.

Attrition

Baseline (T1) assessments were completed by 428 subjects, 386 (86%) of whom subsequently completed one or both follow-up interviews. Follow-up interviews at T2 were completed by 343 participants (80.1%), and 320 (74.8%) completed T3 follow-up assessments. There were no statistically significant differences in follow-up rates between study conditions, although there were site differences in T2 and T3 completion rates ($F[7,420] = 3.24, p = 0.002$, and $F[7,420] = 2.51, p = 0.015$, respectively).

BRIDGES classes were delivered simultaneously across study sites, with five waves of classes taught during a 2-year period. Classes were 2½ hours in length and were held once a week for 8 weeks. All classes were taught by certified BRIDGES instructors in recovery from SMI. Classes ranged in size from 4 to 13 participants, were taught in community mental health centers, and were available free of charge.

On average, the participants attended 5 of 8 classes (mean, 4.85; SD, 3.34) either in person or by makeup session. There were no significant differences in attendance by wave of courses taught throughout the study ($F[8,203] = 1.23, p = 0.284$). However, there were significant differences in attendance by site ($F[8,203] = 4.27, p = 0.000$), ranging from a mean of 4 classes at one site to a high mean of 8 at another. Because of the significant differences in attendance and follow-up rates by study site, site was used as a control variable in all analyses.

Intervention Fidelity

The BRIDGES instructors were observed on multiple occasions by one or both of the local study coordinators. Model fidelity was assessed weekly throughout the entire period of service delivery

using a detailed checklist to track adherence to prescribed content and instructional modalities. Fidelity checklist scores were reviewed weekly with the instructors, who covered any missed course content in subsequent BRIDGES sessions. Across all sessions taught in all waves, total course fidelity ranged from 92.7% to 98.6%, with a mean of 95.1% (SD, 0.04%). There were no significant differences in course fidelity by wave ($F[4,19] = 2.45, p = 0.082$) or by study site ($F[7,16] = 1.60, p = 0.207$), indicating excellent intervention fidelity.

Services as Usual Control Condition

This study used a wait-list control group design. The control group participants received services as usual and were assigned to a course waiting list that guaranteed them an opportunity to receive BRIDGES after their final interview. Throughout the intervention period and 6-month follow-up, no BRIDGES classes were offered outside the study at any of the host sites, and thus, the intervention was not available locally to the control subjects.

During the 2-month intervention period, the control subjects continued with the same treatment they were receiving upon study entry, as did the experimental participants. As shown in Table 1, between baseline and 2-month follow-up, 66% of the controls reported receiving case management; 72%, medication management; 59%, individual therapy; 19%, employment services; and 8%, substance abuse treatment. Approximately half (47%) participated in mental health support groups, and 49% attended a drop-in center. There were no significant differences between the control and experimental subjects in receipt of any of these services.

Measures

Empowerment

The Empowerment Scale, a 28-item instrument, was used to assess feelings of empowerment in mental health service settings (Rogers et al., 1997). Items measure self-esteem–self-efficacy, power–powerlessness, community activism, optimism for the future, and righteous anger. Sample items include “I have a positive attitude about myself”; “Very often a problem can be solved by taking action”; and “I feel I am a person of worth, at least on an equal basis with others.” The participants were asked to rate their agreement with each item along a 4-point Likert scale, with 1, strongly agree, to 4, strongly disagree. Items were summed to create a total empowerment score, where higher scores reflect greater feelings of overall empowerment. Interitem reliability for this measure was acceptable, with α values ranging from 0.76 to 0.78 for T1, T2, and T3 measures.

Moderator Variables

Psychiatric Symptoms

Depressive and anxiety symptoms as well as generalized symptom distress were measured using the Brief Symptom Inventory (BSI; Piersma et al., 1994). The BSI demonstrates high concordance with clinician symptom assessment and strong test-retest and internal consistency reliabilities (Derogatis and Melisaratos, 1983). Respondents are asked how much they were bothered in the past week by 53 symptoms with a 5-point response scale ranging from “not at all” to “extremely.” Factor analytic studies of the scale’s internal structure have demonstrated the construct validity of a six-item depression subscale with items such as “feeling lonely,” “thoughts of ending your life,” and “worthlessness” and a six-item anxiety subscale asking about “feeling tense or keyed up,” “feeling fearful,” and “nervousness or shakiness inside.” Ratings across all symptoms are summed to create the Global Severity Index (GSI), a measure of generalized clinical distress. Total scores are converted to area T-scores with a mean of 50 and an SD of 10 based on BSI scoring algorithms (Derogatis, 1993). Interitem reliability for each of the symptom measures was acceptable, with α values ranging from 0.84 to 0.86 for T1, T2, and T3 subscales for depression,

from 0.83 to 0.85 for anxiety, and 0.96 to 0.97 for global symptom distress. Using the clinical cut point (T-score of 63) recommended as the case definition for individuals with depression or anxiety as well as high clinical symptom distress, the participants’ scores were divided into “high” (≥ 63) versus “low” (< 63) symptom severity (McLaughlin et al., 2007).

Statistical Analysis

Using the Statistical Package for the Social Sciences version 18, chi-square and independent-samples *t*-tests were conducted to test for differences between study conditions on the participants’ clinical and demographic characteristics. In addition, zero-order correlations between study condition and the three moderators of interest were computed. For these variables to be considered as potential moderating factors of BRIDGES intervention outcomes, these could not be correlated with study condition at baseline because moderating factors must precede treatment (Kraemer et al., 2002). Next, we used SuperMix software version 1.1 (Hedeker and Gibbons, 1996) to conduct multivariable, longitudinal, random-effects linear regression analysis in which a two-level random intercepts random regression model (RRM) was fitted to the data, controlling for study site as a fixed effect. RRM has the ability to handle issues specific to longitudinal multisite data, such as serial correlation among repeated observations within individual participants, fixed versus time-varying covariates, and missing observations (Gibbons et al., 1993). This method assumes that data are missing at random and produces valid statistical inferences without excluding missing data (Laird, 1988). Our models included intervention, time, and the hypothesized moderator. Two-way interaction terms were included in each model for each moderator \times time along with three-way interaction terms to test our three hypotheses using two-tailed tests of significance: a) study condition \times depressive symptom severity \times time, b) study condition \times anxiety symptom severity \times time, and c) study condition \times generalized symptom distress \times time.

RESULTS

Study Participant Background Characteristics

Of the 428 participants who entered the study, 212 were randomly assigned to the experimental group; and 216, to the control group. Background features of the two groups are presented in Table 1. No significant differences were found between the intervention and control group participants on demographic, clinical, or mental health service utilization characteristics. Therefore, randomization was successful. The depressive symptom severity mean for the total group of 66.05 (SD, 10.4) was 1.5 SDs higher than the population norm ($x = 50$), indicating significant symptoms in this population. Moreover, 70% had standardized scores of 63 or greater, exceeding the cut point indicating clinical depression (Derogatis, 1993; McLaughlin et al., 2007). The anxiety symptom severity mean was 68.15 (SD, 10.8), and 77% of the participants exceeded the cutoff, indicating an anxiety disorder of clinical significance. For the general symptom distress index (GSI), the mean was 70.6 (SD, 9.3), and 84% of the participants exceeded the clinical significance cut point of 63.

Zero-order correlations between study condition and the participants’ scores on the three hypothesized moderating variables at baseline were not significant. Given that no significant relationships were present at baseline, depressive and anxiety symptom severity and global symptom distress can be explored as moderators of the intervention’s treatment effect (Baron and Kenny, 1986).

Unadjusted Mean Scores for Empowerment

Table 2 presents the preintervention (T1) and 6-months post-intervention (T3) empowerment means for the high and low severity subgroups by study condition. This table shows that the BRIDGES

TABLE 1. Baseline Characteristics of BRIDGES Study Participants by Study Condition^a

	Total (N = 428)	Experimental (n = 212) ^b	Control (n = 216) ^b
	n (%)	n (%)	n (%)
Sex			
Male	190 (44.4)	98 (46.2)	92 (42.6)
Female	238 (55.6)	114 (53.8)	124 (57.4)
Race			
White	229 (53.5)	112 (52.8)	117 (54.2)
Black	146 (34.1)	75 (35.4)	71 (32.9)
Hispanic/Latino	18 (4.2)	10 (4.7)	8 (3.7)
Asian/Pacific Islander	1 (0.2)	1 (0.5)	0
American Indian/Alaskan	25 (5.8)	10 (4.7)	15 (6.9)
Other	7 (1.6)	3 (1.3)	4 (1.8)
Education			
Lower than high school	129 (30.1)	67 (31.6)	62 (28.7)
High school/GED	173 (40.4)	79 (37.3)	94 (43.5)
At least some college	126 (29.4)	66 (31.1)	60 (27.8)
Married or cohabiting	64 (15.0)	27 (12.7)	37 (17.1)
One or more children	251 (58.6)	122 (42.5)	129 (59.7)
Lives in own home/apartment	205 (47.9)	104 (49.1)	101 (46.8)
Employed	38 (8.9)	20 (9.4)	18 (8.3)
Age, mean (SD), yrs	42.8 (10.9)	42.7 (9.9)	43.0 (11.8)
BSI depression T-score, mean (SD)	66 (10.4)	66 (10.1)	66 (10.7)
BSI anxiety T-score, mean (SD)	68 (10.5)	68 (10.3)	68 (10.7)
BSI GSI, mean (SD)	70 (9.3)	70 (9.2)	71 (9.6)
Ever in psychiatric inpatient treatment	312 (72.9)	151 (71.2)	161 (74.5)
Self-reported <i>DSM-IV</i> diagnosis			
Schizophrenia	66 (15.4)	37 (17.5)	29 (13.4)
Schizoaffective	23 (5.4)	9 (4.2)	14 (6.5)
Bipolar	169 (39.5)	85 (40.1)	84 (38.9)
Depressive	77 (18.0)	38 (17.9)	39 (18.1)
Other	37 (8.6)	15 (6.9)	22 (10.0)
Services during intervention period			
Case management	224 (65.3)	110 (64.3)	114 (66.3)
Medication management	243 (70.8)	119 (69.6)	124 (72.1)
Individual therapy	190 (55.4)	88 (51.5)	102 (59.3)
Support group for mental illness	177 (51.6)	96 (56.1)	81 (47.1)
Employment services	67 (19.5)	35 (20.6)	32 (18.6)
Drop-in center	182 (53.1)	97 (56.7)	85 (49.4)
Substance abuse treatment	21 (6.1)	8 (4.7)	13 (7.6)
Study site			
Chattanooga	97 (22.7)	48 (22.6)	49 (22.7)
Knoxville	67 (15.7)	33 (15.6)	34 (15.7)
Memphis	87 (20.3)	43 (20.3)	44 (20.4)
Nashville	87 (20.3)	44 (20.8)	43 (19.9)
Dickson	20 (4.7)	10 (4.7)	10 (4.6)
Gallatin	25 (5.8)	12 (5.7)	13 (6.0)
Oak Ridge	34 (7.9)	17 (8.0)	17 (7.9)
Cookeville	11 (2.6)	5 (2.4)	6 (2.8)

^aVariations in sample size are due to missing data.

^bNonparametric (chi-square) and inferential (*t*) tests indicated no significant differences by study condition.

BSI indicates Brief Symptom Inventory; *DSM-IV*, *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*; GED, General Educational Development high school equivalency degree.

intervention led to statistically significant increases in empowerment only for the intervention participants with high levels of depression, anxiety, and generalized symptom distress. In addition, Cohen's *d* estimates indicate medium effect sizes (*i.e.*, >0.3) for each of the three moderators.

Multivariate Analyses

Table 3 shows the results of the multivariable random-effects regression analysis testing depressive, anxiety, and generalized symptom distress as mixed effects, as well as the interaction effects

TABLE 2. Unadjusted Mean Scores, *t*-Tests, and Effect Sizes for Empowerment at Baseline and Follow-up by Symptom Severity and Study Condition Groupings

Participants Grouped by Symptom Severity and Study Condition	T1 ^a Mean	T3 ^b Mean	<i>t</i> -Value (<i>df</i>)	Effect Size Cohen's <i>d</i>
BSI depression				
High depressive symptoms/experimental	2.72	2.86	-4.51 (106)***	-0.43
High depressive symptoms/control	2.76	2.78	-0.67 (116)	-0.06
Low depressive symptoms/experimental	2.95	2.99	-1.21 (49)	-0.17
Low depressive symptoms/control	2.98	2.99	-0.30 (45)	-0.04
BSI anxiety				
High anxiety symptoms/experimental	2.74	2.87	-4.94 (123)***	-0.45
High anxiety symptoms/control	2.79	2.79	-0.02 (124)	-0.002
Low anxiety symptoms/experimental	3.01	3.02	-0.12 (33)	-0.02
Low anxiety symptoms/control	2.94	3.02	-1.67 (37)	-0.27
BSI overall symptom distress				
High symptom distress/experimental	2.76	2.88	-5.06 (134)***	-0.44
High symptom distress/control	2.79	2.81	-0.52 (137)	-0.04
Low symptom distress/experimental	3.04	3.02	0.32 (21)	0.06
Low symptom distress/control	3.01	3.05	-0.74 (24)	-0.14

^aT1: baseline.

^bT3: 6 months after intervention.

****p* ≤ 0.001.

BSI indicates Brief Symptom Inventory.

of symptom level × study condition × time on the empowerment outcome, controlling for study site. The results revealed a significant three-way interaction in the first model, indicating that the BRIDGES participants with high depressive symptoms showed greater gains over time than those with low depressive symptoms or the control subjects with either high or low depressive symptoms. Turning next to the model testing the moderating effects of anxiety, the three-way

interaction was significant, indicating that the BRIDGES participants with high levels of anxiety showed greater gains than the BRIDGES participants with low anxiety or the control condition subjects with either high or low anxiety. In the final model, the BRIDGES participants with high levels of generalized symptom distress showed greater gains in empowerment than the participants with low distress or the control condition subjects with either high or low distress. Thus, the

TABLE 3. Mixed-Effects Random Regression Analyses: Depression, Anxiety, and Global Symptom Distress as Moderators of the Relation of BRIDGES Intervention to Empowerment Outcome, Controlling for Study Site (*N* = 428)

Models Testing Moderating Variables	MIXREG Estimate ^a	SE	Z-Value	<i>p</i>
Intercept	2.97	0.04	65.72	0.000
SC	-0.01	0.03	-0.34	0.734
Time	0.01	0.01	0.46	0.648
High depressive symptoms	-0.25	0.04	-6.12	0.000
High depressive symptoms × time	0.00	0.02	0.18	0.861
High depressive symptoms × time × SC	0.04	0.02	2.47	0.013
Intercept	2.98	0.05	58.55	0.000
SC	-0.01	0.03	-0.15	0.881
Time	-0.01	0.02	-0.32	0.748
High anxiety symptoms	-0.24	0.04	-5.28	0.000
High anxiety symptoms × time	0.02	0.02	0.95	0.342
High anxiety symptoms × time × SC	0.04	0.02	2.48	0.013
Intercept	3.78	1.00	38.52	0.000
SC	-0.02	0.03	-0.48	0.632
Time	0.00	0.01	0.12	0.908
High symptom distress	-0.01	0.00	-10.82	0.000
High symptom distress × time	0.00	0.01	0.01	0.991
High symptom distress × time × SC	0.03	0.01	2.29	0.022

^aEstimates are unstandardized MIXREG coefficients and do not represent effect sizes; sign of coefficient indicates direction of effect. SC indicates study condition.

hypothesized interactions of BRIDGES participation and high levels of depressive symptoms, anxiety symptoms, and generalized symptom distress were observed for the outcome of personal empowerment.

DISCUSSION

Our results confirm the effectiveness of the BRIDGES intervention while revealing the moderating effect of symptoms of depression, anxiety, and generalized symptom distress on an important study outcome. These findings mirror the results of research on physical ISM programs. Studies of psychoeducational self-management interventions for physical illnesses such as prostate cancer, macular degeneration, and other chronic medical conditions such as hypertension and arthritis have shown greater improvement in outcomes such as function, vitality, health-related quality of life, self-esteem, and self-efficacy among those with high levels of depressive symptoms compared with those with low levels (Brody et al., 2002; Harrison et al., 2012; Helgeson et al., 2006; Jerant et al., 2008). Our study supports and adds to this literature by showing that, after a peer-led educational self-management intervention for mental illness, greater gains in empowerment were observed among those with high levels of depressive symptoms, anxiety symptoms, and generalized symptom distress.

BRIDGES may be particularly effective for those with high levels of depressive symptoms because its content focuses on esteem enhancement that enables participants to combat feelings of inadequacy. The program's emphasis on recognizing situations that trigger negative thoughts and feelings may have helped the participants to avoid situations that lowered their self-confidence. In addition, through interactions with credible role models who were recovered BRIDGES instructors, those with higher levels of depression may be witnessing first-hand accounts of recovery success and effective coping strategies that lead to increases in self-perceived self-esteem and overall morale and empowerment.

By providing didactic instruction and exercises focused on the structured problem-solving process, BRIDGES may help participants with anxiety feel better able to address life problems in an orderly, systematic manner and more confidently handle unforeseen situations, thereby increasing their ability to cope with ambiguity and uncertainty (Cook et al., 2011). BRIDGES participants are also guided in developing a detailed crisis plan or an "advanced directive" to proactively inform others of their own wishes when dealing with emotional crises and postcrisis readjustment. Creation of these plans may have been particularly helpful to those with high levels of anxiety by providing participants with a greater sense of control over their lives.

A primary tenet of the BRIDGES program is its emotional stages of recovery principle, in which the various stages of recovery, namely, recuperation, rebuilding, and recovery/discovery, are highlighted. Participants learn skills to better identify and manage their feelings and emotions at each phase of the recovery process. These therapeutic tools enable participants to work through negative feelings, such as self-hate, and transfer them into positive emotions, such as self-acceptance (Diehl et al., 2006). Through BRIDGES, participants become awakened to the possibilities of life after an episode; thus, it is not surprising that those with the highest levels of generalized symptom distress may have more to gain in terms of empowerment.

The fact that BRIDGES has been found to operate in a manner similar to self-management interventions for physical illnesses and chronic conditions suggests that these types of interventions may have similar change mechanisms. Because these interventions interact with symptoms of depression, anxiety, and generalized symptom distress in a similar manner to produce positive health behavior change outcomes, we might expect to see similar forces in operation. One set of forces may be related to the satisfying relationships developed with other peers at ISM intervention programs (Brody et al., 2002). In addition to modeling teachers and fellow students, the

intervention reduces social isolation and builds a sense of hope that recovery from mental illness is possible.

Our study was limited by several factors. First, our study sample included only mental health consumers in the state of Tennessee, thereby limiting the generalizability of our findings to the national population. Second, ratings of psychiatric symptoms consisted of self-report only and did not include clinical assessments or researcher ratings. Finally, our analyses did not account for other fundamental conditions that may have influenced outcomes, such as the recovery "climate" at local service delivery agencies.

Our findings that participants with high symptom levels not only benefit from a peer-led education program for the self-management of mental illness but, in fact, also experience more gains than their less symptomatic counterparts in an outcome fundamental to recovery is a valuable lesson learned from this study. These results may have important implications for ISM programs in general, particularly given the high prevalence of chronic health problems among the mentally ill population (*i.e.*, diabetes, hypertension; Dixon et al., 2000). Some ISM programs may not consider emotionally symptomatic participants to be appropriate candidates on the basis of general observations that people with more severe psychological symptoms are less likely to achieve recovery-oriented outcomes than less symptomatic participants (Resnick et al., 2004; Shahar and Davidson, 2003). Rather than considering these associations at face value, we have additional evidence that individuals with severe symptoms do indeed benefit from peer-led educational ISM interventions. On the basis of the results of our study, as well as several published findings in the physical ISM field, it is becoming increasingly apparent that ISM programs should tailor their structure and content to accommodate individuals with high levels of depression, anxiety, and generalized symptom distress.

The results of this analysis provided information on "who" may be most responsive to the BRIDGES program in terms of enhanced empowerment overtime. Future directions for research in this area should include shifting the focus to "why" this intervention is more effective for particular groups of participants by examining further potential mediating factors of the BRIDGES intervention. Future studies might also explore whether these mediators interact with specific active ingredients of the intervention, such as increased knowledge and social support, to influence the outcome of empowerment.

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