

# Impact of Wellness Recovery Action Planning on Service Utilization and Need in a Randomized Controlled Trial

Judith A. Cook, Jessica A. Jonikas,  
and Marie M. Hamilton  
University of Illinois at Chicago

Virginia Goldrick  
Chicago–Read Mental Health Center, Chicago, Illinois

Pamela J. Steigman, Dennis D. Grey, Larisa Burke,  
Tina M. Carter, and Lisa A. Razzano  
University of Illinois at Chicago

Mary Ellen Copeland  
The Copeland Center, Brattleboro, Vermont

**Objective:** The purpose of this study was to assess the impact of a mental illness self-management intervention, called Wellness Recovery Action Planning (WRAP), on the use of and need for mental health services over time compared with nutrition and wellness education. **Method:** Participants were recruited from outpatient community mental health settings in Chicago, Illinois. Using a single-blind, randomized controlled trial design, 143 individuals were assigned to WRAP or to a nutrition education course and assessed at baseline and at 2-month and 8-month follow-up. The WRAP intervention was delivered by peers in recovery from serious mental illness who were certified WRAP educators over nine weekly sessions lasting 2.5 hrs. The nutrition education curriculum was taught by trained non-peer educators using the same schedule. Mixed-effects random regression analysis tested for differences between the two interventions in (a) self-reported use of 19 clinical, rehabilitation, peer, emergent, and ancillary services; and (b) self-reported need for these services. **Results:** Results of mixed-effects random regression analysis indicated that, compared with controls, WRAP participants reported significantly greater reduction over time in service utilization (total, individual, and group), and service need (total and group services). Participants in both interventions improved significantly over time in symptoms and recovery outcomes. **Discussion:** Training in mental illness self-management reduced the self-reported need for and use of formal mental health services over time. This confirms the importance of WRAP in an era of dwindling behavioral health service availability and access.

**Keywords:** illness self-management, mental health service utilization, recovery

With the adoption of a recovery paradigm in the field of public mental health (Onken, Craig, Ridgway, Ralph, & Cook, 2007), along with increasing calls for peer support and self-help (Davidson, Chinman, Sells, & Rowe, 2006), growing attention has been paid to the development and testing of peer-taught mental illness self-management interventions (Mueser et al., 2002). These pro-

grams have been shown to enable people with psychiatric disabilities to acquire information and behavioral skills to better manage troublesome symptoms (Cook, Copeland, Floyd et al., 2012; Fukui et al., 2011), feel more hopeful about their futures (Salyers et al., 2009; Starnino et al., 2010), enhance feelings of empowerment and recovery (Goldberg et al., 2013; Pickett, Diehl, Steigman, Fox, &

Judith A. Cook, Jessica A. Jonikas, and Marie M. Hamilton, Department of Psychiatry, University of Illinois at Chicago; Virginia Goldrick, Chicago–Read Mental Health Center, State of Illinois Department of Health, Chicago, Illinois; Pamela J. Steigman, Dennis D. Grey, Larisa Burke, Tina M. Carter, and Lisa A. Razzano, Department of Psychiatry, University of Illinois at Chicago; Mary Ellen Copeland, WRAP and Recovery Books, The Copeland Center, Brattleboro, Vermont.

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Correspondence concerning this article should be addressed to Judith A. Cook, PhD, University of Illinois at Chicago, Department of Psychiatry, 1601 West Taylor Street, 4th Floor, M/C 912, Chicago, IL 60612. E-mail: [cook@ripco.com](mailto:cook@ripco.com)

Cook, 2012), and acquire greater confidence in advocating for themselves with mental health professionals (Jonikas et al., 2013).

Given the new attitudes and competencies that people in recovery develop as a result of these programs, it is possible that their need for and use of formal services may diminish. One reason for this is that illness self-management interventions promote the establishment of healthier lifestyles (Clark & Hampson, 2001; Hibbard, Mahoney, Stock, & Tusler, 2007) and greater adherence to treatment regimens (Hill, Bird & Johnson, 2001; Smith, Rublein, Marcus, Brock, & Chesney, 2003), both of which can prevent illness reoccurrence. In addition, illness self-management programs teach patients to recognize and deal appropriately with worsening symptoms of their conditions so that patients can intervene early to prevent illness exacerbations (Bourbeau et al., 2003). The impact of these programs on service use was evident in a study of illness self-management for patients with heart disease, lung disease, stroke, or arthritis, which found significantly decreased use of outpatient services and emergency-room care at 1- and 2-year follow-ups (Lorig et al., 2001). A recent meta-analysis of research on illness self-management programs for patients with a variety of chronic medical conditions (Brady et al., 2013) also found evidence for reduction in use of inpatient services. However, we could locate no published studies that examined the impact of mental illness self-management programs on use of clinical, rehabilitation, emergent, and other mental health services. Thus, the purpose of this study was to test two hypotheses. First, we predicted that participants in the Wellness Recovery Action Planning (WRAP; Copeland, 1997) program would report decreased use of behavioral health services over time in comparison to participants in a nutrition education curriculum. Second, we predicted that WRAP participants would report decreased need for services over time, compared with controls.

## Method

This randomized controlled trial compared WRAP (Copeland, 1997) with an evidence-based nutrition education course called Choosing Wellness (CW; Vreeland, Toto, & Sakowitz, 2007) that was adapted from a larger curriculum called Solutions for Wellness (Lindenmayer et al., 2009). Participants were recruited from six community mental health programs located in Chicago, Illinois. Sites were chosen based on the availability of certified WRAP educators, as well as minimal prior local exposure to the WRAP and Solutions for Wellness programs. Written informed consent was obtained from all research participants using procedures approved by the University of Illinois at Chicago (UIC) Institutional Review Board.

## Participants

Participants were individuals with serious mental illness as defined by federal Public Law 102-321 specifying diagnosis, duration, and level of disability (Epstein, Barker, Vorburger, & Murtha, 2002). As documented by their community mental health-provider organization, they had a 12-month *DSM-IV-TR* (American Psychiatric Association, 2000) disorder accompanied by serious impairment, defined by the state of Illinois (Illinois Department of Human Services, 2011) as a mental or emotional impairment that resulted “. . . in a limitation of their capacities for

primary activities of daily living, interpersonal relationships, homemaking, self-care, employment or recreation”. Other inclusion criteria were age (18 years or older), ability to provide informed consent, comprehension of spoken English, and no prior WRAP or Solutions for Wellness education.

Information about the study was disseminated by the Illinois Division of Mental Health (DMH), advocacy organizations (National Alliance for Mental Illness of Greater Chicago), and notices posted at the participating community mental health centers (CMHCs). Enrollment commenced January, 2010 and ended September, 2010. The study's local coordinators met with potential participants at the CMHCs to describe the two interventions, explain the research procedures, answer questions, and enroll interested individuals.

Of 351 individuals contacted, 208 were not randomly assigned, either because they declined participation, were determined to be ineligible, or did not complete enrollment procedures. The remaining 143 were randomly assigned to the WRAP ( $n = 72$ ) or CW ( $n = 71$ ) conditions. Over time, 16 WRAP participants (22%) and seven CW participants (10%) either refused participation or were lost to follow-up for reasons including death or ill health, moving away from the area, or formal withdrawal from the study. A difference test of these two proportions revealed a nonsignificant chi square using Fisher's exact test ( $p = .07$ , 2-tailed). Thus, the attrition rates were not significantly different by study condition. Data from the 143 participants assigned to the two conditions were included in the analysis, given the study's intent to treat design (Fergusson, Aaron, Guyatt, & Hébert, 2002).

## Intervention and Control Conditions

Intervention participants received WRAP (Copeland, 1997), which is an evidence-based practice that consisted of nine, 2.5-hr group sessions that were facilitated free of charge by two trained and certified instructors in recovery from mental illness, with backup instructors available as needed. Group sessions consisted of lectures, individual and group exercises, personal sharing and role modeling, and voluntary homework to practice using and refining one's WRAP plan between groups. The content of each session is described fully elsewhere (Cook, Copeland, Jonikas et al., 2012), and consisted of: (a) the key concepts of WRAP and recovery, (b) personalized strategies to maintain well-being, (c) daily maintenance plans with simple and affordable tools to foster daily wellness, (d) advance planning to proactively respond to self-defined symptom triggers, (e) early warning signs that a crisis is impending and advance planning for additional support during these times, (f) advance crisis planning to identify preferred treatments and supporters when in acute phases of the illness, and (g) postcrisis planning to resume daily activities and revise one's WRAP plan if needed. Throughout all nine classes, participants were encouraged to identify, discuss, and record natural and informal family, peer, and community supports to manage their psychiatric disability without the need for more costly formal treatment or services.

Control condition participants received the intervention, Choosing Wellness: Healthy Eating Curriculum (Vreeland, Toto, & Sakowitz, 2007). CW is a nutrition education intervention holistically focused on wellness. We adapted CW for this study into nine, 2.5 hour weekly sessions that were led free of

charge by two, trained nonpeer instructors, with backup instructors available as needed. Class content consisted of lectures on nutrition and physical activity that were designed to help people with mental illnesses make healthier food, beverage, and other lifestyle choices, while addressing modifiable health risk factors such as obesity and diabetes. Curricular activities also included self-assessment of a healthy lifestyle, appraisal of knowledge and personal confidence to grasp and use the new material, tools to monitor progress, and measurement of health indicators such as the body mass index (BMI). Participants were encouraged to access social and community supports to attain and maintain optimal health. Evidence suggests that the larger Solutions for Wellness program helps reduce, reverse, and prevent psychotropic-associated weight gain, while lowering BMI and glucose and triglyceride levels (Lindenmayer et al., 2009; Littrell, Hilligoss, Kirshner, Petty, & Johnson, 2003; Vreeland et al., 2003). Studies also show that, in addition to these outcomes, intervention completers report sleeping better, feeling less stressed, and having confidence that they will maintain the lifestyle changes they chose to improve their overall well-being (Hoffmann et al., 2008).

## Procedure

UIC Survey Research Laboratory (SRL) personnel who were blinded to study condition administered 1-hr structured telephone interviews at: baseline (T1); 2-month follow-up (T2); and 8-month follow-up (T3). Participants received a research stipend of \$20 for the first interview, \$25 for the second, and \$30 for the third, with a \$10 bonus for completing all three. Interviews were conducted via Computer Assisted Personal Interviewing (CAPI) software.

At the end of the first interview, respondents were randomly assigned at the CMHC level using blocked random allocation with randomly selected block sizes (Efird, 2011). Employing computer-generated assignment, participants were randomized within blocks so that equal numbers of subjects were assigned to each condition. Allocation proceeded by randomly selecting one of the orderings and assigning the next block of participants to study groups according to the specified sequence, using randomly selected block sizes to further mask assignment (Schulz & Grimes, 2002). Programming the allocation sequence into the CAPI software allowed for complete allocation concealment up to the point of assignment (Gluud, 2006), so that both interviewers and respondents were unaware of the study condition assignment until after it occurred. Follow-up interviewers were blinded to study condition. To monitor the blind, they recorded at the conclusion of each 2- and 8-month interview whether participants had revealed their actual study condition. This was found to have occurred in only 4% of all interviews.

Of the 143 participants who completed baseline assessments, 129 participants (90%) completed Time 2 interviews, and 120 (84%) completed Time 3 interviews. There were no statistically significant differences in follow-up rates between intervention and control conditions at either time point. Finally, there were no significant differences in completion of follow-up interviews by study site.

## Measures

**Service utilization and need.** The primary outcome was self-reported mental health service utilization and need, assessed using the Support Service Index or SSI (Heller, Roccoforte, & Cook, 1997). This checklist measures the need for and use of 19 clinical, rehabilitation, emergent, and peer support services by presenting respondents with a series of detailed service definitions and asking them to indicate for each whether they used the service in the past 6 months, and whether they needed the service at present. The total affirmative responses are summed to create a measure of service “need” at the time of the interview and “use” in the 6 months prior to the interview. In a study of service utilization and unmet service needs among patients with schizophrenia and their families (Chien, Norman & Thompson, 2004), interrater and internal reliability of the SSI were found to be 0.88 and 0.84, respectively. Regarding validity, in a study of adults with developmental disabilities (Heller, Miller, & Hsieh, 1999), scores on the Index distinguished significantly between intervention and control groups receiving home-based family support, with intervention recipients using significantly more services and reporting significantly lower service need. In another study using the SSI (Caldwell, Heller, & Taylor, 2007), caregivers with higher unmet service needs had poorer mental health than those with lower unmet service needs. In addition to total number of services, we constructed measures of individual-oriented services (e.g., case management, medication management), and group-oriented services (e.g., group therapy, family therapy).

**Symptom severity and recovery.** Two additional variables were assessed. The first was level of psychiatric symptom severity which was measured using the Global Symptom Severity Index (GSI) of the Brief Symptom Inventory (BSI; Derogatis, 1993). The BSI is a patient self-report instrument showing high concordance with clinician symptom assessment (Preston & Harrison, 2003) and strong test-retest and internal consistency reliabilities (Derogatis & Melisaratos, 1983). The GSI is a summary measure that provides an overall assessment of the individual’s level of psychological distress. The second variable was the individual’s self-perceived sense of recovery, which was measured by the Recovery Assessment Scale (RAS) 24-item total score (Corrigan, Salzer, Ralph, Sangster, & Keck, 2004). This scale conceptualizes recovery as a status with components of empowerment, quality of life, hope, meaning of life, and tolerable symptom levels.

## Analysis

Data were downloaded into a commercially available database system (IBM SPSS, 2006) after which the success of randomization was tested and intercorrelations of model variables were examined. Next, multivariate, longitudinal random-effects linear regression analysis was conducted to test for differences between participants in service utilization and need, as well as in symptom distress and self-perceived recovery over time. A two-level random-intercepts model was fitted to the data, with WRAP = 1 and CW = 0, and time coded as 1 = baseline, 2 = 2-month follow-up, and 3 = 8-month follow-up. Our modeling approach was chosen to address problems of serial correlation among repeated observations within individual participants, missing observations given that not all subjects completed all assessments, and inclusion of both time-varying and fixed covariates (Gibbons et al.,

1993). Analyses were conducted using SUPERMIX 1.0 software (Hedeker & Gibbons, 1996). Given that randomization was successful (described below), models did not include control variables. For all analyses,  $p < .05$  was considered significant using a one-tailed test due to the directional hypothesis being tested.

## Results

As shown in Table 1 (all *ns* included), approximately half of the participants (50.3%) were female and they averaged 45.9 years of age ( $SD = 11.16$ ). Almost two fifths (19.6%) were Hispanic/Latino; over two thirds (67.1%) were African American, and another 18.2% were members of other racial minority groups. Over a third (37.8%) had less than a high school education, and another third (32.8%) had attended college. Only 9.8% were currently married, and 60.1% had one or more children. Close to half

(48.3%) resided in their own homes or apartments with an average household size of 3.2 individuals. Only 2.8% were employed, and 73.2% had been hospitalized one or more times for psychiatric reasons. Over a quarter (26.1%) reported that they had a schizophrenia-spectrum diagnosis, 30.8% bipolar disorder, 26.9% depressive disorder, and 16.2% some other diagnosis. At study baseline, close to three-quarters (74.1%) reported receiving case management services, 85.3% medication management, 74.1% individual therapy, 53.8% group therapy, 18.9% employment services, 39.2% residential services, and 17.5% substance abuse treatment. Baseline, GSI average scores were approximately 2 standard deviations above the mean, indicating severe levels of psychiatric symptoms. Finally, mean baseline recovery scores were similar to those found in a study of adults participating in outpatient consumer-directed services (Mukolo, Heflinger, & Bax-

Table 1  
Characteristics of Participants in Each Study Condition<sup>a</sup>

| Variable   | Total<br>( <i>N</i> = 143) |         | WRAP <sup>b</sup><br>( <i>n</i> = 72) |         | Choosing<br>wellness <sup>b</sup><br>( <i>n</i> = 71) |         |
|--|----------------------------|---------|---------------------------------------|---------|---|---------|
|  | <i>n</i>                   | %       | <i>n</i>                              | %       | <i>n</i>  | %       |
| Sex  |                            |         |                                       |         |   |         |
| Male   | 71                         | 49.7    | 38                                    | 52.8    | 33  | 46.5    |
| Female   | 72                         | 50.3    | 34                                    | 47.2    | 38  | 53.5    |
| Hispanic/Latino ethnicity                        | 28                         | 19.6    | 11                                    | 15.3    | 17  | 23.9    |
| Race   |                            |         |                                       |         |   |         |
| Caucasian  | 21                         | 14.7    | 9                                     | 12.5    | 12  | 16.9    |
| Black/African American                           | 96                         | 67.1    | 50                                    | 69.4    | 46  | 64.8    |
| Asian/Pacific Islander                           | 1                          | 0.7     | 1                                     | 1.4     | 0   | 0.0     |
| American Indian/Alaskan                          | 4                          | 2.8     | 3                                     | 4.2     | 1   | 1.4     |
| Other race                                       | 21                         | 14.7    | 9                                     | 12.5    | 12  | 16.9    |
| Education  |                            |         |                                       |         |   |         |
| < High school                                    | 54                         | 37.8    | 28                                    | 38.9    | 26  | 36.6    |
| High school/GED                                  | 42                         | 29.4    | 23                                    | 31.9    | 19  | 26.8    |
| Some college or greater                          | 47                         | 32.8    | 21                                    | 29.2    | 26  | 36.6    |
| Marital status                                   |                            |         |                                       |         |   |         |
| Married or cohabiting                            | 14                         | 9.8     | 8                                     | 11.1    | 6   | 8.5     |
| All other  | 129                        | 91.2    | 64                                    | 88.9    | 65  | 91.5    |
| One or more children                             | 86                         | 60.1    | 64                                    | 88.9    | 46  | 64.8    |
| Residing in own home/apt.                        | 69                         | 48.3    | 35                                    | 48.6    | 34  | 47.9    |
| Employed at baseline                             | 4                          | 2.8     | 2                                     | 2.8     | 2   | 2.8     |
| Mean ( <i>SD</i> ) number in household           | 3.22                       | (3.49)  | 3.11                                  | (3.29)  | 3.34  | (3.71)  |
| Mean ( <i>SD</i> ) age, years                    | 45.90                      | (11.16) | 45.92                                 | (12.22) | 45.81   | (10.04) |
| Ever psychiatric inpatient Tx                    | 104                        | 73.2    | 51                                    | 70.8    | 53  | 75.7    |
| Services received—baseline                       |                            |         |                                       |         |   |         |
| Case management                                  | 106                        | 74.1    | 52                                    | 72.2    | 54  | 76.1    |
| Medication management                            | 122                        | 85.3    | 63                                    | 87.5    | 59  | 83.1    |
| Individual therapy                               | 106                        | 74.1    | 56                                    | 77.8    | 50  | 70.4    |
| Group psychotherapy                              | 77                         | 53.8    | 38                                    | 52.8    | 39  | 54.9    |
| Employment services                              | 27                         | 18.9    | 16                                    | 22.2    | 11  | 15.5    |
| Residential services                             | 56                         | 39.2    | 27                                    | 37.5    | 29  | 40.8    |
| Substance abuse trtmt.                           | 25                         | 17.5    | 12                                    | 16.7    | 13  | 18.3    |
| DSM-IV Diagnosis                                 |                            |         |                                       |         |   |         |
| Schizophrenia                                    | 25                         | 19.2    | 13                                    | 20.0    | 12  | 18.5    |
| Schizoaffective                                  | 9                          | 6.9     | 3                                     | 4.6     | 6   | 9.2     |
| Bipolar  | 40                         | 30.8    | 20                                    | 30.8    | 20  | 30.8    |
| Depressive                                       | 35                         | 26.9    | 16                                    | 24.6    | 19  | 29.2    |
| Other  | 21                         | 16.2    | 13                                    | 20.0    | 8   | 12.3    |
| Mean ( <i>SD</i> ) Global Symptom Severity Index | 69.6                       | (11.0)  | 70.4                                  | (10.8)  | 68.9  | (11.2)  |
| Mean ( <i>SD</i> ) Recovery Assessment Scale     | 92.2                       | (15.4)  | 91.0                                  | (16.5)  | 93.2  | (14.4)  |

<sup>a</sup> Variation in *n* due to missing data. <sup>b</sup> No significant differences by study condition in *t*-test and chi-square analyses.



ter, 2011). Chi-square and *t* tests revealed no significant differences on these characteristics between experimental and control subjects, confirming the success of randomization.

Table 2 presents means and standard deviations for the study's two dependent variables of self-reported service utilization and service need at T1, T2, and T3. Table 3 presents the results of mixed-effects random regression analysis in which the longitudinal effects of the WRAP intervention are represented by the interaction of WRAP by time (the Intervention  $\times$  Time coefficient). Also in these models, the time coefficient represents the degree of change in *both* groups over time, and the intervention coefficient represents any baseline difference between the two study conditions on the dependent variable.

Regarding the first outcome of service utilization, compared with CW participants, WRAP participants reported receiving significantly fewer different services over time. Whereas the average number of services used (out of 19 potential services queried) among WRAP participants declined from a mean of 10.3 at baseline to 7.2 at T2 and then 7.1 at T3, among CW participants, the average number of services needed declined from 9.4 at baseline to 8.1 at T2, and then 7.8 at T3 (see Table 2). WRAP participants also reported significantly greater decreases in number of individual-oriented services used over time, compared with CW participants. Finally, compared with CW participants, WRAP participants reported significantly greater decreases over time in number of group-oriented services used.

Regarding the second hypothesis concerning perceived need for services, compared with controls, WRAP participants reported significantly greater decreases over time in the total number of needed services. While the average number of services needed among WRAP participants fell from a mean of 8.2 at baseline to 6.0 at T2 and then 5.9 at T3, among CW participants the average number of services needed declined from 7.9 at baseline to 6.1 at T2, but then rose at T3 to 6.8 (see Table 2). Comparing differences between the two conditions in perceived need for individual-oriented services, the estimate fell just short of significance at  $p = .05$ . Finally, regarding need for group-oriented services, WRAP participants reported significantly greater decreases over time than CW participants (see Table 3).

While these findings support our hypotheses of a greater decrease in the utilization of and need for mental health services among WRAP participants relative to CW participants, these results might be associated with poorer outcomes among those who

used fewer services. To test this possibility, we ran the same random regression model for the outcomes of psychiatric symptom severity on the GSI and self-perceived recovery on the RAS. Results (not shown) indicated that participants in *both* WRAP and CW improved significantly over time in both of these important outcomes.

## Discussion

The results of our study of mental illness self-management confirm the findings of earlier research on illness self-management for chronic medical conditions (Bourbeau et al., 2003; Lorig et al., 2001); that is, participants report using fewer formal health services and having lower unmet service needs. Moreover, while service utilization and need declined to a significantly greater extent among WRAP versus CW participants, both groups showed significant improvement in clinical and recovery outcomes. This suggests that declining need for and use of formal services following WRAP participation is not accompanied by poorer psychiatric or psychosocial outcomes.

Why might the practice of WRAP result in lower service utilization and fewer unmet service needs? One reason lies in the model's philosophy, and the nature of attitudes and skills imparted by the curriculum. WRAP embodies the concept of person-centered planning which suggests that a service-defined life is a life not fully realized (O'Brien, 1989). In practice, this means that WRAP's concept of self-management helps people to identify strengths and access community resources that can be used in place of some services. Indeed, our prior research on WRAP (Cook, Copeland, Jonikas et al., 2012) found that, compared with controls, WRAP participants reported significantly greater ability to handle life's challenges, and greater confidence in their ability to set and achieve goals. WRAP also encourages participants to incorporate safe and affordable natural supports into plans that they can follow to maintain wellness. Compared with controls, WRAP participants in our earlier study (Cook, Copeland, Floyd et al., 2012) reported greater confidence that they had a plan in place to help them maintain wellness. Such confidence in one's WRAP plan may reduce participants' perceived need for formal services. WRAP has also been shown to increase participants' involvement in health care decision-making interactions with their mental health treatment providers (Jonikas et al., 2013). This may make

Table 2  
Service Utilization and Need Over Time by Study Condition

| Condition  | WRAP        |             |             | Choosing wellness |             |             |
|--|-------------|-------------|-------------|-------------------|-------------|-------------|
|  | T1 (n = 72) | T2 (n = 64) | T3 (n = 56) | T1 (n = 71)       | T2 (n = 65) | T3 (n = 64) |
| Mean (SD) total number of services received                            | 10.3 (4.8)  | 7.2 (4.8)   | 7.1 (5.3)   | 9.4 (4.8)         | 8.1 (4.8)   | 7.8 (4.8)   |
| Mean (SD) number of individual-oriented services <sup>a</sup> received | 6.5 (3.0)   | 4.6 (3.2)   | 4.8 (3.3)   | 6.0 (2.9)         | 5.0 (3.0)   | 5.2 (2.9)   |
| Mean (SD) number of group-oriented services <sup>b</sup> received      | 3.8 (2.3)   | 2.6 (2.2)   | 2.4 (2.2)   | 3.4 (2.2)         | 3.1 (2.1)   | 2.5 (2.3)   |
| Mean (SD) total number of services needed                              | 8.2 (3.5)   | 6.0 (3.2)   | 5.9 (3.7)   | 7.9 (4.1)         | 6.1 (3.0)   | 6.8 (3.5)   |
| Mean (SD) number individual-oriented services <sup>a</sup> needed      | 5.1 (2.2)   | 3.8 (2.1)   | 3.9 (2.4)   | 5.0 (2.5)         | 3.7 (2.0)   | 4.5 (2.2)   |
| Mean (SD) number of group-oriented services <sup>b</sup> needed        | 3.1 (1.8)   | 2.2 (1.7)   | 2.0 (1.9)   | 2.9 (1.8)         | 2.4 (1.5)   | 2.3 (1.8)   |

<sup>a</sup> Individual-oriented services = case management, crisis intervention, residential, medication management, vocational, educational, individual therapy, medical, legal, complementary/alternative, substance abuse, public benefits/entitlements. <sup>b</sup> Group-oriented services = recovery center, drop in center, mental health support group, non-mental health support group, family therapy, group therapy, group psychoeducation.

Table 3  
*Effects of Study Condition (WRAP vs. Control) on Service Utilization and Need, Mixed-Effects Random Regression (N = 143)*

| Outcome variable   | Estimate (SE) | z score | p value |
|--|---------------|---------|---------|
| Total number of services received                                  |               |         |         |
| Intercept  | 10.06 (0.72)  | 13.78   | .0001   |
| Intervention condition   | 1.38 (1.04)   | 1.33    | .0911   |
| Time   | -0.75 (0.27)  | -2.74   | .0030   |
| Intervention × time  | -0.78 (0.39)  | -1.98   | .0238   |
| Total number of individual-oriented services <sup>a</sup> received |               |         |         |
| Intercept  | 6.21 (0.46)   | 13.34   | .0001   |
| Intervention condition   | 0.82 (0.66)   | 1.23    | .1085   |
| Time   | -0.35 (0.17)  | -1.95   | .0292   |
| Intervention × Time  | -0.45 (0.26)  | -1.73   | .0415   |
| Total number of group-oriented services <sup>b</sup> received      |               |         |         |
| Intercept  | 3.86 (0.33)   | 11.52   | .0001   |
| Intervention condition   | 0.57 (0.48)   | 1.19    | .1160   |
| Time   | -0.40 (0.13)  | -3.15   | .0008   |
| Intervention × Time  | -0.33 (0.18)  | -1.81   | .0353   |
| Total number of services needed                                    |               |         |         |
| Intercept  | 8.01 (0.54)   | 14.85   | .0001   |
| Intervention condition   | 1.01 (0.83)   | 1.33    | .0917   |
| Time   | -0.53 (0.21)  | -2.52   | .0058   |
| Intervention × Time  | -0.63 (0.30)  | -2.07   | .0187   |
| Total number of individual-oriented services <sup>a</sup> needed   |               |         |         |
| Intercept  | 4.94 (0.36)   | 13.78   | .0001   |
| Intervention condition   | 0.53 (0.51)   | 1.04    | .0148   |
| Time   | -0.27 (0.15)  | -1.80   | .0361   |
| Intervention × time  | -0.35 (0.21)  | -1.64   | .0501   |
| Total number of group-oriented services <sup>b</sup> needed        |               |         |         |
| Intercept  | 3.07 (0.27)   | 11.23   | .0001   |
| Intervention condition   | 0.48 (0.39)   | 1.24    | .1079   |
| Time   | -0.27 (0.11)  | -2.47   | .0066   |
| Intervention × Time  | -0.28 (0.16)  | -1.76   | .0395   |

Note. WRAP = Wellness Recovery Action Planning.

<sup>a</sup> Individual-oriented services = case management, crisis intervention, residential, medication management, vocational, educational, individual therapy, medical, legal, complementary/alternative, substance abuse, public benefits/entitlements. <sup>b</sup> Group-oriented services = recovery center, drop in center, mental health support group, non-mental health support group, family therapy, group therapy, psycho-education groups.

them better able to articulate their needs to providers and advocate for these needs to be met.

At the same time, we observed significant improvement among both WRAP and CW participants in mental illness symptom severity and sense of recovery. One reason may be the fact that WRAP effectively teaches people to identify impending crises and avert them, whereas CW has been shown to reduce feelings of stress, a known trigger for mental health crises (Blashill, Perry, & Safren, 2011). Because both interventions taught participants readily employable holistic wellness strategies, it may be that both interventions led participants to better manage difficult life situations, thereby reducing their level of symptomatic distress and enhancing their feelings of recovery.

A number of study limitations bear mention, the first of which is that the generalizability of our findings is limited by the fact that all study participants resided in the Chicago area and were not drawn from a national probability sample of individuals with serious mental illness. Second, we relied on participant self-reports regarding service utilization that we were unable to corroborate with administrative data, such as claims or other billing information. We also used participant self-report to measure service need, symptom severity, and level of recovery that we were unable to

corroborate with reports of more objective observers, such as clinicians or family members. Finally, a longer follow-up time period might have revealed different longitudinal results than those we observed.

Ours is the first randomized controlled trial demonstrating that WRAP has a sustained effect on both reported mental health-service utilization as well as perceived need for services. Moreover, both the need for and use of services continued to decrease among WRAP recipients for six months after the end of the intervention, suggesting that newly acquired illness management skills persist beyond the time of WRAP group participation. Results were also fairly consistent across individual and group service settings, confirming WRAP's effectiveness in reducing utilization and need for a variety of types of formal assistance.

As many have documented, our field is witnessing the "slow starvation of the mental health system" (Appelbaum, 2003, p. 115) due to ever-dwindling funding streams (Lutterman, Hogan, Phelan, & Mazade, 2010). This has led to the steady erosion of available treatment (Cunningham, 2009), and limited access to those services that remain (Grazier, Mowbray, & Holter, 2005). Now more than ever, there is a need to develop and evaluate effective lower cost interventions in resource-deprived public service environ-

ments. A growing body of research indicates that WRAP addresses these imperatives. It is relatively low in cost, can be effectively delivered by peers in the community, improves important clinical and recovery outcomes, and now, we have shown that it reduces the need for and use of more costly formal services. As a critical component of publicly funded recovery interventions, additional research on WRAP's impact on the need for and utilization of formal services will be beneficial to the field.

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