Randomized Controlled Pilot Study of an Occupational Time-Use Intervention for People With Serious Mental Illness

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KEY WORDS
- activities of daily living
- community mental health services
- mentally ill persons
- time management
- treatment outcome

OBJECTIVE. We assessed the efficacy and clinical utility of a new occupational time-use intervention, Action Over Inertia, designed to improve occupational balance and engagement among community-dwelling people with serious mental illness.

METHOD. Using a randomized controlled design, we assigned 24 participants to an intervention group or standard care group. Participants were community-dwelling people with serious mental illness receiving assertive community treatment services. Data on time use, occupational balance, and engagement were collected and compared at baseline and 12-wk posttest.

RESULTS. Eighteen participants completed the pilot study. Treatment group participants increased their occupational balance by spending an average of 47 min more per day in activity than the control group \( p = .05 \). Differences in occupational engagement were not shown, but evidence of clinical utility was found.

CONCLUSION. This pilot study of Action Over Inertia has shown evidence of efficacy and clinical utility.

People with serious mental illness (SMI) have been characterized as being at high risk for limited participation in meaningful activities, having few opportunities for emotional fulfillment and personal growth, and experiencing social marginalization. Evidence has indicated that the community lives of people with SMI are disproportionately reflective of exclusion from important social roles, such as employment and parenting; they also experience living conditions marked by poverty, limited access to decent housing, limited social supports, and restricted opportunities for full participation in daily community life (Eklund, Hansson, & Ahlqvist, 2004; Harvey, Jeffreys, McNaught, Blizard, & King, 2007). Studies of the actual time use of people with SMI have shown patterns of pervasive and persistent imbalance of occupations and evidence of disengagement from occupations (Krupa, McLean, Eastabrook, Bonham, & Baksh, 2003; Leufstadius, Erlandsson, & Eklund, 2006; Minato & Zemke, 2004).

Several evidence-based service delivery models have been developed to positively affect the occupational lives of people with SMI. Supported employment, education, and socialization models have, for example, demonstrated that assertive, individualized, and continuous support services can lead to positive outcomes in important productivity and leisure occupations (Sylvestre, Nelson, Sabloff, & Peddle, 2007; Twamley, Jeste, & Lehman, 2003). Few interventions, however, have explicitly focused on assertively developing the occupational potential of people with SMI who are persistently uninvolved and apparently uninterested in meaningful activities and occupations. In this article, we present research evaluating the efficacy of a new occupation-based intervention, Action Over Inertia (AOI; Krupa et al., 2007), meant to address the
needs of people with SMI whose community lives have become characterized by pervasive occupational imbalance and disengagement.

**Review of the Literature**

**Occupational Balance, Engagement, and Time Use**

The relationship between occupation and health has long been studied and discussed. Occupation is clearly linked to survival (Wilcock, 2006) and to meaningful activity and self-worth (Kielhofner, 2004). A critical review of the research regarding health and occupation revealed a strong relationship among occupation, health, and well-being (Law, Steinwender, & Leclair, 1998).

The concepts of occupational balance and engagement describe particular dimensions of occupation that are fundamental to health and well-being. **Occupational balance** is defined as the organization of daily activities in a manner that enables health and well-being, allowing for variations in participation in labor and work, home management, parenting, leisure, and rest activities (Wilcock et al., 1997). **Occupational engagement** captures the importance of the individual’s connection to and investment in occupations as well as the degree to which occupations are grounded in the broader social context. Bejerholm and Eklund (2007) operationalized these elements of engagement as “the extent to which a person has a variety and range of meaningful occupations and routines, and the ability to move around in society and interact socially” (p. 21). Occupational engagement can lead to health through emotional fulfillment, participation in valued social activities in the community, opportunities for personal growth, and overall life satisfaction (Bejerholm, Hansson, & Eklund, 2006; Townsend & Polatajko, 2007).

Time use is linked to occupation, because time is fundamental to how people organize and structure their daily lives. Time-use patterns give evidence of balance or imbalance as well as the nature and levels of engagement in occupation and are therefore useful in evaluating risks to health and well-being (Pentland & McColl, 1999). Understanding how people spend their time can be a particularly useful approach to the study of occupational balance and engagement. Using this approach, one can, for example, examine actual involvement in activities and capture the complex array of activities that constitute daily life and influence well-being.

**Occupational Experiences of People With SMI**

SMI is defined as a psychiatric disorder, typically including a component of psychosis, that persists over time and significantly compromises daily function (Schinnar, Rothbard, Kanter, & Jung, 1990). In the context of SMI, barriers to occupational balance and engagement are both internal and external to the person. Internal barriers include impairments thought to be expressions of the illness, including positive symptoms, such as hallucinations, and negative symptoms, such as anhedonia and affective blunting (Guthrie, 2002). Cognitive functioning can also be disrupted in SMI, and problems are often reported in attention, memory, and problem solving (Tarrier & Bobes, 2000). The medications used to treat the mental illness may have refractory symptoms and produce unpleasant, activity-limiting side effects (Guthrie, 2002). Beyond their impact on occupational performance, these internal elements of the illness can negatively affect the person’s emotional experience of occupations, experiences that are fundamental to ensure that the personal meaning associated with activities will translate to sustained interest and commitment.

External barriers to occupation that emerge in the context of mental illness are perhaps even more limiting than the internal barriers. Historically, attention to community resources for this population has been lacking. The development of integrated treatment, rehabilitation, and support services, such as assertive community treatment (ACT) and intensive case management, represent efforts to address the comprehensive range of daily living needs experienced by people with SMI. However, a growing body of evidence has suggested that the design and delivery of these services tend to be dominated by attention to clinical treatment issues, constraining the ability of occupational therapists and other service providers to address occupational and related issues (Horgan, 2007; Krupa et al., 2004). People with SMI are likely to live in conditions of poverty and disadvantage, conditions that restrict access to socially important occupations and the resources essential to maintain adequate levels of personal self-care (Boydell, Gladstone, Crawford, & Trainor, 1999). The societal stigma of mental illness has been associated with both discrimination in access to opportunities for meaningful occupations and self-stigmatization—the internalization of the legitimacy of this exclusion (Corrigan & O’Shaughnessy, 2007).

**Occupational Therapy Interventions**

Research evidence has confirmed that the time-use patterns of people with SMI living in the community reflect occupational imbalance and disengagement. These studies have consistently reported patterns of increased sleep and passive leisure along with decreased productivity and...
active leisure compared with the general population (Krupa et al., 2003; Leufstadius et al., 2006; Minato & Zemke, 2004). Occupational disengagement is shown in the limited range of activities, social interactions, and community-based activities. Productivity patterns, for example, tend to include fewer hours in the day, and productive occupations tend to be related to home management (Krupa et al., 2003).

The occupational therapy literature has documented therapeutic processes to address time use, occupational balance, and occupational engagement. For example, the Occupational Questionnaire (Smith, Kielhofner, & Watts, 1986) is a well-known instrument that logs daily participation in occupation. To date, however, the systematic development and evaluation of occupational therapy interventions focusing on these issues as they apply to people with SMI has been limited. The intervention described in this article represents one initiative to develop evidence-based occupational therapy practice in this area.

Study Aim and Hypothesis

Our aim in this study was to pilot test the efficacy of AOI (Krupa et al., 2007), an occupational time-use intervention geared toward community-dwelling people with SMI who experience barriers to occupational balance and engagement. The specific hypothesis guiding this study was as follows: Participants in the AOI intervention will experience improved occupational balance and engagement compared with participants who receive standard care after 12 wk of treatment. The AOI intervention will also demonstrate clinical utility.

Method

Study Participants

People with SMI living in the community were recruited from five ACT teams in southeastern and eastern Ontario, Canada. The teams were located in small, medium, and large urban centers (Belleville, Kingston, and Ottawa, respectively). Because ACT teams specifically focus on delivering time-unlimited, community-based services to people with SMI, positive occupational outcomes are consistent with their mission, and because the teams also employ occupational therapists, they were a natural choice for the pilot test.

Design

A prospective, multisite, randomized controlled trial of the AOI intervention ran from September 2007 to May 2008. Control participants received standard ACT care, and treatment participants received standard ACT care and the AOI intervention. The treatment was delivered by ACT occupational therapists, who worked one on one with each treatment participant over 12 wk, with once-weekly visits over that time period. All occupational therapists involved in the delivery of the intervention were trained by the primary investigator (Edgelow) in how to deliver the treatment before the beginning of the study to ensure treatment consistency.

Approval was received from Queen’s University’s Research Ethics Board. Each occupational therapist recruited 3 to 6 clients from their respective teams, and after completion of informed consent, the clients were randomized into the control or the treatment condition.

Description of the AOI Intervention

AOI (Krupa et al., 2007) was designed specifically for application with people with SMI whose daily lives in the community are characterized by pervasive and persistent occupational imbalance and disengagement (Edgelow, 2008).

The intervention is presented in a workbook format delivered in an individualized manner. The goal of the intervention is to reconnect clients with meaningful activity to promote health and well-being. Occupational balance and engagement are presented as public health issues; the workbook explicitly advocates for their recognition as a fundamental responsibility of community mental health services. A revised version of AOI was recently published (Krupa et al., 2010); the revision incorporated feedback from the pilot study to enhance the workbook’s clinical utility.

Two theoretical frameworks underlay the intervention. The first is the Canadian Model of Occupational Performance and Engagement (CMOP–E; Townsend & Polatajko, 2007). Consistent with this model, the intervention focuses directly on occupation as the domain of concern; attends to the broad range of spiritual, personal, and environmental factors that influence occupation; and considers both the performance and the experience aspects of occupation. The second theoretical framework is that of recovery, which has gained widespread acceptance as a paradigm for service design and delivery in mental health (Anthony, 2000). Consistent with recovery, this workbook provides an approach to collaborating with people living with mental illness to enable their engagement in activities (Noordsy et al., 2002).

The therapeutic processes for change in this intervention are derived from several approaches that have demonstrated effectiveness with this population. First, the
intervention is based on enabling engagement, an intervention process that is a core occupational therapy competency (Barris, Kielhofner, & Hawkins Watts, 1983; Townsend & Polatajko, 2007). The intervention depends heavily on what Barris and colleagues (1983) referred to as “exhorting to action” (p. 63) while respecting self-determination. The intervention includes elements of psychoeducation (Pekkala & Merinder, 2002) and a range of cognitive and behavioral strategies for change (Jones, Cormac, Silveira da Moto Neto, & Campbell, 2004; Wallbridge, Furer, & Lionberg, 2008).

The workbook contains a variety of information and worksheets meant to promote full collaboration with the client. The intervention is divided roughly into five sections: (1) determining the need for change and securing investment in the change process, (2) reflecting on current occupational balance and engagement patterns with rapid introduction of and support for meaningful activities, (3) providing information about the relationship between SMI and occupational balance and engagement, (4) long-term goal planning and support, and (5) ongoing monitoring and refinement of plans.

Data Collection

Outcome data were collected from all participants at pretest and posttest. Time-use information was collected using 24-hr time diaries, divided into hourly sections, over a 2-day period and was analyzed using Statistics Canada (1998) time codes. Time-use information was gathered in collaboration with the participants and therapists; therapists visited clients the day after the 24-hr collection period to ensure correctness of recall in the “yesterday diaries.” These data were collected outside the 12-wk treatment timeline so that visits from the therapists would not influence time use. Changes in the balance of activity and rest were measured, as were changes in time spent in self-care, productivity, and leisure (CAOT, 2002), thus revealing the extent of occupational balance experienced by the participant.

Occupational engagement was measured objectively using the Profiles of Occupational Engagement for People With Schizophrenia (POES; Bejerholm et al., 2006). The POES uses data collected from the 24-hr time diaries. The categories of engagement are daily rhythm of activity and rest, variety and range of occupations, place, social environment, social interplay, client interpretation, extent of meaningful occupations, routines, and initiating performance. The 9-category instrument ranks each category on a scale ranging from 1 (low) to 4 (high). The maximum score is 36, and a score close to that number would represent a person with a variety of occupations, environments, social interactions, and demonstrable meaning in life. The POES is a new tool with initially positive data on interrater reliability ($k_s = .5–.82$), internal consistency ($95–.97$), and content validity (Bejerholm & Eklund, 2006; Bejerholm et al., 2006).

Clinical utility was measured with questionnaires designed for pilot study and based on evaluation literature. Separate versions were developed for treatment participants and the occupational therapists who delivered the treatment and were only completed at posttest.

Data Analysis

We performed statistical analyses using SPSS (Version 16.0; SPSS Inc., Chicago). Because of small samples sizes and nonnormal distributions of the sample, we used nonparametric statistics for all analyses. Only participants who completed both pretest and posttest data collection were included in the analyses. Because the participants differed both by treatment group (control, $n = 10$) and ACT team (Kingston, $n = 2$; Belleville, $n = 1$; Ottawa, $n = 2$), we made comparisons for both types of independence.

The first goal of the analysis was to ensure that the treatment groups and ACT teams did not differ demographically. Descriptive statistics were calculated first; for interval variables, these statistics were means, standard deviations, and ranges; for categorical variables, the statistics were frequencies and proportions. Assessment of differences between groups was achieved by using Fisher’s Exact Test to compare the differences between categorical variables, and all interval variables were compared using the Mann–Whitney test for differences between treatment groups and the Kruskal–Wallis test for differences between ACT teams.

The second goal of the analyses was to assess the baseline scores and differences at posttest for all outcome measures. We compared the POES measure of occupational engagement by treatment group and ACT team using the Mann–Whitney test for differences between treatment groups and the Kruskal–Wallis test for differences between ACT teams.

To analyze occupational balance, we first computed the reliability of the time diary data. Kalton (1985) stated that data from more than one 24-hr period can be combined if $r \geq .40$. Because the pre- and posttest data both contained two 24-hr time diaries for all participants, we analyzed the reliability of combining the 2 days. Guttman split-half correlation coefficients were calculated to ascertain the level of correlation of time spent across several categories of time use. The categories—sleep (including naps), self-care,
productivity, and leisure—were based on both occupational therapy theory (CAOT, 2002) and Statistics Canada data (Statistics Canada, 1998).

Once the data’s reliability was verified, we analyzed occupational balance by using Mann–Whitney tests for differences between treatment groups and Kruskal–Wallis tests for differences between ACT teams at both baseline and posttest. Time use was divided using the categories mentioned in the preceding paragraph.

After all the outcome measures had been statistically analyzed, we assessed the impact of demographic characteristics on the outcome measures using scatter plots and Spearman’s ρ correlations to ensure that differences in demographics did not influence the baseline scores and changes at posttest.

The third goal of data analysis was to report on the intervention’s clinical utility. Feedback was gathered from both the occupational therapists and the treatment participants by means of questionnaires. It was summarized in categories of logistics, learning, personal changes, and other comments; these categories were used in the questionnaire.

Results

Participant Characteristics

Of the 24 participants, 18 completed the entire study; of these 18 participants, 8 were control participants and 10 were treatment participants (see Tables 1 and 2 for demographic characteristics). Gender was not recorded for this study; because the number of participants per team was small, recording gender posed a risk of violating confidentiality.

The treatment group differed significantly on two demographics: (1) age (ρ = .016) and (2) length of time since diagnosis (ρ = .026). The treatment group was significantly older and had a longer time since diagnosis than the control group. We found no significant differences when ACT teams were compared, and these results are not reported.

Because age and length of illness are highly positively correlated (r = .87), we analyzed the effect of age on outcome measures to avoid redundancy in calculations. To investigate the effect of age on measures of occupational balance and occupational engagement, we drew scatter plots and calculated Spearman’s ρ correlations (not shown). We found that none of the correlations were strong or statistically significant; therefore, a difference in age between the control and treatment groups did not significantly affect the outcome measures used in the study.

Attrition Analysis

The dropout rate for the study was 25% (20% for control-group participants and 28.6% for treatment-group participants). The attrition rates for the two groups were not significantly different (χ² [1, N = 24] = 0.032, p = .86). All dropouts from the study were voluntary; no participants were removed from the study by their ACT team or the research team because of mental health issues. Reasons cited for leaving the study were scheduling conflicts and lack of interest. Participants were given a small honorarium after pretest and posttest data collection.

Occupational Balance Outcomes

Occupational balance, measured by time use, shifted away from sleep to increased general activity in the treatment group (ρ = .05, Table 3). The control group increased time spent in sleep by 22 min/day at posttest, and the treatment group decreased its time spent in sleep by 47 min/day. Therefore, although the control group actually increased the time spent sleeping at the end of the study, the treatment group spent an average of 47 min more each day engaged in activity. The differences in time use were not significant when participants were compared by ACT teams; thus, those results are not reported. The shift in activity was general and not tied to a group increase in a specific category of time use because individual choice is promoted in the AOI intervention. However, no clients documented that their time use shifted to include new or increased unhealthy behaviors.

Table 1. Demographic Characteristics: Numerical

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Control (n = 8)</th>
<th>Treatment (n = 10)</th>
<th>Test Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Range</td>
<td>SD</td>
</tr>
<tr>
<td>Age (yr)</td>
<td>32.38</td>
<td>21–48</td>
<td>9.40</td>
</tr>
<tr>
<td>Yr since diagnosis</td>
<td>10.75</td>
<td>3–23</td>
<td>7.59</td>
</tr>
<tr>
<td>Yr served by ACT</td>
<td>2.94</td>
<td>1–7</td>
<td>1.90</td>
</tr>
<tr>
<td>Education (yr)</td>
<td>12.38</td>
<td>9–14</td>
<td>1.60</td>
</tr>
</tbody>
</table>

Note. ACT = assertive community treatment; SD = standard deviation. *p ≤ .05.
Post hoc power calculations revealed that the statistical power to detect a difference in sleep between the groups was 57%. The effect size was calculated at $d = 0.86$ (Cohen, 1977), which is considered a large effect, meaning that we can be confident that at posttest, the difference in time spent in sleep between the groups was large.

### Occupational Engagement Outcomes

Treatment and control groups did not differ on the occupational engagement measure (Table 4). None of the nine categories of the POES showed any significant differences, and they are not reported. We found no significant differences in scores when participants were compared by ACT team, and thus those results are not reported. Post hoc power analysis for the POES revealed that the power to detect differences between the groups was 7.3%. Changes that do exist may not have been detected because of low statistical power or lack of sensitivity in the measure to the minor changes that might occur in occupational involvement.

### Clinical Utility Outcomes

**Treatment Participant Feedback.** All treatment participants who finished the study ($n = 10$) chose to complete the voluntary feedback questionnaire in written format. Every respondent found the content of the intervention helpful, and several ($n = 4$) commented on the positive experience of reflecting on activity patterns and monitoring their own progress. Some ($n = 4$) were struck by the need for structure in their time use, writing “I am happier being productive and useful” and “I learned to exercise in my spare time; it made me think about how I spend my time.” Two participants were pleased to have learned about the importance of pleasurable activities, such as reading, and were more often incorporating those activities into their daily lives. One participant stated, “I feel better, I feel satisfied that I’m not sitting on the sofa all day watching TV.”

All 10 respondents stated that they would recommend this treatment to other people with mental illness. General comments about the treatment included that “the treatment helped me realize my human potential” and that “a kick in the butt was needed! And self-implemented, thanks.” No concrete changes were suggested to make the intervention easier to understand and use in their daily lives.

**Therapist Feedback.** All 5 occupational therapists involved in delivering the study’s treatment responded to

### Table 2. Demographic Characteristics: Categorical

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Control ($n = 8$)</th>
<th>Treatment ($n = 10$)</th>
<th>Fisher’s Exact Test ($p$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Team</td>
<td>Frequency %</td>
<td>Frequency %</td>
<td></td>
</tr>
<tr>
<td>Kingston 1</td>
<td>1 12.5 1 10.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kingston 2</td>
<td>1 12.5 2 20.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Belleville</td>
<td>3 37.5 3 30.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ottawa 1</td>
<td>2 25.0 2 20.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ottawa 2</td>
<td>1 12.5 2 20.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diagnosis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schizoaffective</td>
<td>0 0.0 4 40.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>8 100.0 6 60.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Housing (rental)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apartment</td>
<td>5 62.5 5 50.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>House</td>
<td>0 0.0 3 30.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group home</td>
<td>3 37.5 2 20.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Living situation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alone</td>
<td>5 62.5 5 50.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>With family</td>
<td>0 0.0 2 20.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roommate(s)</td>
<td>3 37.5 3 30.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>7 87.5 7 70.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Separated</td>
<td>1 12.5 0 0.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Divorced</td>
<td>0 0.0 2 20.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>0 0.0 1 10.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes, but live apart</td>
<td>1 12.5 2 20.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>7 87.5 8 80.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>1 12.5 1 10.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>7 87.5 9 90.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td>NA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>0 0.0 0 0.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>8 100.0 10 100.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income source</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Disability pension</td>
<td>8 100.0 10 100.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>0 0.0 0 0.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note.** NA = not applicable.

### Table 3. Occupational Balance Results

<table>
<thead>
<tr>
<th>Time Use Category (Hr)</th>
<th>Control ($n = 8$)</th>
<th>Treatment ($n = 10$)</th>
<th>Test Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>SD</td>
<td>Mean</td>
<td>SD</td>
</tr>
<tr>
<td>Sleep</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>10.76 2.40</td>
<td>10.88 1.68</td>
<td>0.13</td>
</tr>
<tr>
<td>Change at posttest</td>
<td>0.37 1.21</td>
<td>-0.78 1.46</td>
<td>1.96</td>
</tr>
<tr>
<td>Self-care</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>1.81 0.93</td>
<td>2.40 2.51</td>
<td>0.00</td>
</tr>
<tr>
<td>Change at posttest</td>
<td>-0.53 0.85</td>
<td>-0.63 1.53</td>
<td>0.52</td>
</tr>
<tr>
<td>Productivity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>2.15 1.22</td>
<td>2.15 1.09</td>
<td>0.18</td>
</tr>
<tr>
<td>Change at posttest</td>
<td>-0.32 1.51</td>
<td>0.09 2.02</td>
<td>0.00</td>
</tr>
<tr>
<td>Leisure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>9.30 1.70</td>
<td>8.56 1.54</td>
<td>0.71</td>
</tr>
<tr>
<td>Change at posttest</td>
<td>0.48 2.04</td>
<td>1.80 0.93</td>
<td></td>
</tr>
</tbody>
</table>

**Note.** 24-hr average of time use. Outcome measure: Time use as measured by Statistics Canada (1998) time codes. NA = not applicable; SD = standard deviation. * $p < .05$. 

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the voluntary written questionnaire regarding the treatment process. All respondents felt that the timeline needed more tailoring to their clients, with 12 wk working for some but not all participants. Two occupational therapists felt that the action and evaluation section could have used more time to work on goals and the removal of barriers to their attainment. However, none wanted to change the intervention’s structure and organization, and 2 commented on the benefits of the intervention’s flexibility. Also, the therapists found the content of the intervention relevant, mentioning that the education section was extremely helpful. A suggestion was made that the reflection worksheets had some redundancy and that they might be more tailored to individual client needs.

Every occupational therapist stated that she would use the AOI intervention with other ACT clients who struggle with occupational imbalance and disengagement. One suggested that she might tailor the order of sections to client needs, and another would like to run the intervention in a group format. The therapists stated that the intervention had "good structure" and that "overall the clients thought it was a worthwhile intervention."

Discussion

Occupational Balance and Engagement

The results of this pilot study provide evidence that the AOI intervention can be effective in influencing occupational balance. Although the comparison of changes in time use between the control and treatment groups at posttest revealed that self-care, productivity, and leisure did not show any significant differences, we found a significant difference between treatment conditions for changes in sleep \( p = .05 \). Although the control group increased time spent in sleep by 22 min at posttest, the treatment group decreased time spent sleeping by 47 min.

In light of a large body of research regarding health and sleep duration, a shift away from abnormal amounts of sleep is positive in and of itself. The study sample spent an average of 10.82 (±1.97) hr in sleep daily at pretest. Increased disease and mortality rates have been linked to people who sleep >9 hr per night, even when demographic and other health factors are considered (Patel, Malhotra, Gotlieb, White, & Hu, 2006). This shift in occupational balance away from excess sleep and toward increased activity is an encouraging finding. Considering that several occupational therapists involved in this study suggested that more time may have been needed for the treatment participants to implement their goals, this trend toward more time spent in activity over sleep is an important change.

When considering occupational engagement and the results of the POES, it is first important to compare the sample from the study to the norms of the tool. Although the tool is relatively new and does not have formalized norms, a study performed by the tool’s authors (Bejerholm & Eklund, 2007) to compare POES scores with other health measures revealed ranges of scores that represent general levels of engagement. In a sample of 72 Swedish outpatients with schizophrenia, 29% were considered to have low levels of occupational engagement, 40% to have moderate levels, and 31% to have high levels. In comparison, at baseline our study population demonstrated 67% low and 33% moderate engagement levels. The mean score for the AOI study group at baseline was 18.69 (±3.22) of 36 points, which ranks in the low range of occupational engagement. Our small sample appeared to experience more profound occupational disengagement than the test population studied by Bejerholm and Eklund (2007), a finding that is not surprising because we specifically recruited participants who experienced profound occupational disengagement. In addition, currently no literature exists regarding the sensitivity of the POES and its ability to detect change, a situation that may have limited the detection of statistical differences at posttest.

Health Behavior Change

The results suggest that the 12-wk time period used for the study may not be adequate to realize change, particularly when patterns of occupational imbalance and disengagement are pervasive and likely longstanding. The Stages of Change model (Prochaska, DiClemente, &

Table 4. Occupational Engagement Results

<table>
<thead>
<tr>
<th>Measure</th>
<th>Control (n = 8)</th>
<th>Treatment (n = 10)</th>
<th>Test Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Scorea</td>
<td>SD</td>
<td>% Change</td>
</tr>
<tr>
<td>POES</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pretest</td>
<td>19.50</td>
<td>3.57</td>
<td></td>
</tr>
<tr>
<td>Change at Posttest</td>
<td>-1.88</td>
<td>4.95</td>
<td></td>
</tr>
</tbody>
</table>

Note. Outcome measure: Profiles of Occupational Engagement for People With Schizophrenia (POES; Bejerholm et al., 2006). The scoring of the POES is such that an increase in score indicates improvement. SD = standard deviation.

*Out of 36 points.
Norcross, 1992) is useful when considering the length of
time needed for behavioral change. Originally created in
the context of addictions, the model has more recently
been applied to health behaviors such as weight loss and
smoking cessation as well as to people with mental illness
and the general population. The stages of change are
precontemplation, contemplation, preparation, action,
and maintenance. The estimation is that at any one point
in time, only 20% of the population is ready to consider
and implement a lifestyle change (Rollnick, Mason, &
Butler, 1999). Although the stages of precontemplation
and contemplation typically exhibit no changes in be-
havior, the preparation stage is when small changes be-
come evident, before obvious behavior change becomes
apparent in the action phase. Participants in the treat-
ment group may have reached the stages of preparation
by the end of the 12-wk intervention; thus, we found
a trend toward more time spent in activity in general.
Had the study continued beyond 3 mo, perhaps partic-
ips could have moved further along the continuum to
the action stage.

Research on health behavior change for the general
population, as well as for people with SMI, has revealed
the difficulty that clinicians face in educating people re-
Tarding health behaviors and achieving behavior change.
Recent studies of specific health behavior changes within
the Canadian and U.S. populations (increased physical
activity, healthy eating, and smoking cessation) have had
low rates of participation and change (Handley et al.,
2006; O’Loughlin, Paradis, Gray-MacDonald, & Renaud,
1999). These results show the difficulties that health
professionals often have in engaging the general pop-
ulation in health-promoting activities.

Health behavior change for people with SMI has been
less thoroughly researched than behavior changes made by
the general population. To date, we know of no ran-
domized controlled trials of exercise interventions, and
dropout rates from existing programs have been reported
to be ≥50% (Richardson, Faulkner, et al., 2005). A recent
program designed to increase physical activity for people
with SMI using an 18-wk intervention reported an ex-
tremely high dropout rate of 69%, with a small weight
loss for participants who finished the study (Richardson,
Avripas, Neal, & Marcus, 2005). An eight-session com-
munity-based smoking cessation program for people with
SMI reported a dropout rate of 40%, with a quit rate of
19% (Currie et al., 2008).

Although health behavior change is difficult for the
general population and for people with SMI, small gains are
achievable. Therefore, the small changes in behavior
detected in this pilot study, with its comparatively low
dropout rate, are encouraging and warrant further study.
Perhaps the use of the intervention along with evidence-
based recovery tools, such as the Recovery Workbook (Barbic
& Krupa, 2009; Spaniol, Koehler, & Hutchinson, 1994),
could involve more service providers in attending to ac-
tivities and occupations in day-to-day service delivery.

Limitations

Conducting research with human participants in a com-
munity setting often has limitations associated with the
findings. The use of control and treatment groups, as well
as a pretest–posttest design, served to mitigate some of the
limitations, but the study design was not without issues.
The sample size was a large limitation for the study. AOI
is designed to target clients who experience occupational
imbalance and disengagement. Such clients often have
difficulty engaging with traditional ACT services and,
thus, were challenging to recruit for a research study. The
study’s small sample size led to generally low statistical
power in the data analysis, making the detection of dif-
fferences between groups difficult.

An issue regarding this study’s internal validity was
rates of attrition, defined as differential rates of dropout
from groups (Heard & Harris, 2004). Four participants
in the treatment group dropped out of the study, com-
pared with 2 in the control group. Although attrition
rates were not statistically different, treatment partic-
ips who were not responding to the treatment may
have dropped out of the study, making the average scores
for the treatment group more positive than those of the
control group. It was not possible to complete intention-
to-treat analyses to compensate for this issue, because of
a lack of clarity in ethics forms regarding the use of client
data. Note that study conditions do not necessarily reflect
the options for the real-world use of the AOI in-
tervention. In a real practice context, if a client is feeling
overwhelmed by information or needs to take a break
because of mental health issues or other reasons, the in-
tervention could be scaled back or placed on hold until
the client is ready to move forward with change.

Although external validity was strengthened by the use
of different treatment settings across southeastern Ontario,
increasing generalization across conditions, it was de-
creased by the inability to complete follow-up measures
with the participants (Heard & Harris, 2004). Because of
time constraints and lack of financial resources, follow-up
testing was not completed, limiting the generalization of
the treatment effects over time. Finally, although 2 days
of data were collected at both pretest and posttest to
boost the reliability of the time-use data, external events
often affected time use.
Although the issues of occupational imbalance and disengagement for people with SMI have been well documented on a global level, research regarding the formal treatment of this issue has been sparse to date. This intervention may inspire other occupational therapists to specifically target these issues with structured interventions and document their findings.

**Directions for Future Research**

Although this pilot test has offered some promising and encouraging findings, a large-scale trial, potentially with a longer treatment phase and added follow-up, would serve to confirm the findings and add evidence to the AOI intervention’s efficacy. Some information regarding generalizability has been collected as a result of the study’s multisite format; however, more research is needed to confirm the AOI intervention’s efficacy in other settings. The AOI intervention could be tested in settings that are not part of the ACT model and used in a group format to assess whether a group setting could promote increased behavior changes.

**Conclusion**

This pilot test revealed initially positive data on the AOI intervention’s efficacy and clinical utility. This intervention is the first of its kind and will draw attention to issues of meaningful time use for people with SMI. Further study of the AOI intervention is needed on a larger scale, potentially with a longer treatment timeline and follow-up period to further investigate its usefulness. ▲

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**References**


