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**Background:** Activity scheduling is an established component of evidenced-based treatment for late-life depression in primary care. We examined participant records from the Improving Mood-Promoting Access to Collaborative Treatment (IMPACT) trial to identify activity scheduling strategies used in the context of successful depression care management (CM), associations of activity scheduling with self-reported activity engagement, and depression outcomes.

**Methods:** This study used observational mixed methods analysis of 4335 CM session notes from 597 participants in the intervention arm of the IMPACT trial. Grounded theory was used to identify 17 distinct activity categories from CM notes. Logistic regression was used to evaluate associations between activity scheduling, activity engagement, and depression outcomes at 12 months. All relevant institutional review boards approved the research protocol.

**Results:** Seventeen distinct activity categories were generated. Most patients worked on at least one social and one solitary activity during their course of treatment. Common activity categories included physical activity (32%), medication management (22%), active–non-physical (19%), and passive (14%) activities. We found significant, positive associations between activity scheduling, self-reported engagement in activities at 12 months, and depression outcomes at 12 months.

**Conclusion:** Older primary care patients in CM for depression worked on a wide range of activities. Consistent with depression theory that has placed emphasis on social activities, the data indicate a benefit for intentional social engagement versus passive social and solitary activities. Care managers should encourage patients to balance instrumental activities (e.g., attending to medical problems) with social activities targeting direct interpersonal engagement. Copyright © 2012 John Wiley & Sons, Ltd.

**Key words:** care management; depression; geriatric; behavioral activation

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## Introduction

Major depression and dysthymic disorder affect up to 10% of the older adult population treated in a primary care (Arean *et al.*, 1993; Arean *et al.*, 2008). At this point, the best evidence for treatment of late-life depression in primary care comes from studies of collaborative care models in which care managers (CMs) serve an important role of supporting and augmenting the patient's treating primary care provider (Wagner *et al.*, 1996; Unützer *et al.*, 2002; Oishi *et al.*, 2003; Simon, 2009).

In such programs, CMs typically deliver some or all of the following interventions: patient education, routine symptom monitoring, facilitation of and reinforcement for treatment adherence, and brief behavioral counseling (e.g., activity scheduling, behavioral activation, problem-solving treatment). Of all the treatment supporting activities that CMs perform, behavioral counseling affords the CM the most face-to-face time with patients, and as such may be a potent aspect of care management.

Activity scheduling is a behavioral treatment for depression first described by Lewinsohn and Atwood

(1969) in a case study demonstrating the benefits of positive reinforcement gained from an increase in social engagement and rewarding activities. The early 1970s produced a number of theoretical and empirical advances to understanding the role of behavior on depression (Ferster, 1973; Lewinsohn and Graf, 1973; Beck *et al.*, 1999). These studies provided strong support for interventions aimed at increasing activity in depressed adults, laying the groundwork for four decades of behavioral therapy development.

Activity scheduling has been established as a core component of evidenced-based treatment for depression with equivalent outcomes to cognitive behavioral therapy (Cuijpers *et al.*, 2007). One of the most appealing aspects of activity scheduling as a component of treatment for depression is its relatively straightforward nature, which makes it easy for patients to understand and easy to deliver by health care workers who are not mental health specialists. Little is known from efficacy studies of activity scheduling about the nature of the activities discussed in treatment, relationships between different activities, and their relative impact on depression outcomes. Recent data from an intervention study utilizing problem-solving treatment for primary care (PST-PC) indicated that the types of problems addressed were unrelated to depression outcomes in older adults (Schmaling *et al.*, 2008). Although not equivalent to activity scheduling, these data draw into question the relevance of the type of activity to outcomes. In this study, we utilize data from the largest treatment trial of late-life depression to date (Unützer *et al.*, 2002) to elucidate the types of activities that older adults and their CMs worked on as part of depression treatment and the association between activity scheduling and depression outcomes. As a secondary analysis using observational and qualitative methodologies, our intent was to demonstrate the need, or lack of, further investigation into the specific types of activities supported in activity scheduling for optimal treatment outcomes.

## Methods

The Improving Mood-Promoting Access to Collaborative Treatment (IMPACT) trial enrolled 1801 depressed older adults. Patients were randomized to intervention ( $n = 906$ ) or usual care ( $n = 895$ ). Intervention patients had access to a CM for up to 12 months. CMs offered a range of interventions, including education, behavioral activation including activity scheduling, support of antidepressant management by the patient's primary care physician, and PST-PC. Although patients were free to choose pharmacotherapy or psychotherapy, CMs

were instructed to provide education and behavioral activation support to all patients. They received regular (usually weekly) case supervision by a psychiatrist. Details of the IMPACT methods have been published elsewhere (Unützer *et al.*, 2001).

Care managers used a Web-based tracking tool (Unützer *et al.*, 2003) to document each session with intervention patients and were encouraged to document the goals of activity scheduling and the nature of the problems discussed during sessions. Of the 906 patients who were randomized to the intervention arm, 880 attended at least one care management session and 597 had documentation of specific activities they worked on within one or more session notes. There were a total of 4335 CM session notes for the 597 patients. Of these, 396 did not contain sufficient detail about specific patient activities to be assigned to an activity category. We performed qualitative analyses of all 3939 CM notes with identifiable activity categories from the 597 participants in the intervention arm of the IMPACT trial using a grounded theory approach (Strauss *et al.*, 1990). Three of the authors (G. R., S. V., and J. U.) engaged in an iterative process of reviewing CM notes, generating candidate activity categories, and then meeting as a team to compare and contrast perspectives. Differences in opinion were resolved through consensus. We repeated the cycle until saturation was achieved (i.e., until we were no longer identifying or changing our activity categories) that required review of a sample of approximately 1000 notes from different CMs. After saturation, the remaining 2939 notes were coded by one author (G. R.). Upon completion of the initial coding of all notes, review of each note and its corresponding coding was once again reviewed by one author (G. R.). Inconsistencies were reviewed by the team, and the items were recoded through consensus.

We used logistic regression to identify associations between activity scheduling reported in CM notes, self-reported activity engagement at 12 months, and depression outcomes at 12 months. We operationalized activity scheduling as a true/false dichotomous variable that was set to true if a participant had documented activity scheduling in their session note. Engagement in actual activities at 12 months was assessed using a single Likert-type question, "About how much time in the last 4 weeks did you spend doing activities that were rewarding, meaningful, inspiring, relaxing, enjoyable, or pleasant? Was it: not at all, occasionally, half, most, or all." We treated engagement question as a nominal variable because the response categories were not intended to represent equally sized intervals. Depression outcomes were dichotomized by the achievement of

a 50% or greater reduction in depression symptom severity from baseline or not as measured by the Hopkins Symptom Checklist (Derogatis *et al.*, 1974). We ran univariate analyses to determine potential demographic covariates from the variables collected in IMPACT. These included the following: whether referred or recruited into the study, age, gender, marital status, minority race/ethnicity, high school graduate, Medicare coverage, insurance coverage for medications, presence of more than one mental health diagnosis (i.e., more than just major depression), history of more than two prior episodes of depression, baseline depression score, presence of suicide ideation, treatment preference of pharmacotherapy only, psychotherapy only, neither, or no preference, cognitive impairment, comorbid anxiety, number of chronic medical conditions, chronic pain, functional impairment, quality of life, use of antidepressant medications at baseline, recent mental health specialty care, and current satisfaction with depression care. We included only significant covariates in the multivariate regression analyses.

## Results

As noted, nearly 1/3 of all intervention participants lacked CM notation related to activity scheduling. The presence of session notation mentioning specific activities was predicted using demographic factors such as education, marital status, age, ethnicity, and gender; clinical factors such as functional impairment; and recruitment method (e.g., patient screened or referred to the study; Table 1).

As noted previously, our coding involved an iterative process of review, discussion, revisions of the coding scheme, and further review. We initially generated 17 distinct activity categories (Table 2). Each activity discussed within a single session was placed into one and only one of the 17 categories. When more than one activity was discussed in a session, each activity was coded

separately. For example, if walking, yoga, and celebrating Thanksgiving were all documented in one session, walking and yoga would be assigned to the “physical activity/exercise” category and coded as one activity and Thanksgiving would be assigned to “holiday.” Activities that did not appear to require physical exertion, such as baking, shopping, and playing an instrument, but nonetheless were “active,” were placed in the “active–non-physical” category. Activities that required minimal to no physical exertion and less interaction with the immediate environment such as reminiscing, watching television, and looking at pictures were categorized as “passive” activities.

Sessions most commonly focused on activities related to physical activity/exercise (32%), followed by activities related to medication management (22%), active–non-physical activities (19%), and passive activities (14%) (Table 2).

The socially isolating impact of depression may be of particular concern for older adults. After developing initial categories, we generated the following five higher order categories based on the level and type of social involvement perceived for that activity (social engagement): (1) “solitary,” (2) “social,” (3) “social for others,” (4) “socialize,” and (5) “family.” We coded activities with a clear intention to engage in interpersonal exchange as “socialize.” For example, “call and talk with a friend.” Activities that were stated in a manner that prioritized benefiting others were coded as “social for others.” These included things like “take friend to doctor” and volunteering. “Social” encompasses activities in which an individual would be in a social setting, but the focus of the activity did not prioritize the social interaction. For example, playing cards or going to a coffee shop. As with the detailed type of activity described previously, we assigned each recorded activity into one level of social engagement. For example, playing cards with friends was coded as an “active–non-physical” activity and “social.” Most patients discussed at least one social and one solitary activity during the course of treatment (Table 3).

Table 1 Patient characteristics

Characteristic	Intervention ( <i>n</i> = 906), mean (SD) or <i>n</i> (%)	Patients with session notes ( <i>n</i> = 597)	Patients without session notes ( <i>n</i> = 309)	<i>p</i> -values
Education: high school or higher	530 (58.5%)	380 (63.7%)	150 (48.5%)	<0.001
Married/living with partner	401 (44.3%)	290 (48.6%)	111 (35.9%)	<0.001
Mean age	71 (7.4)	71.5 (7.4)	70 (7.1)	0.003
Ethnic minority	197 (21.7%)	114 (19.1%)	83 (26.9%)	0.007
Female	581 (64.1%)	399 (66.8%)	182 (58.9%)	0.018
Mean health-related functional impairment (0–10)	4.7 (2.6)	4.6 (2.6)	4.9 (2.7)	0.037
Referred to (versus screened for) study	450 (49.7%)	311 (52.1%)	139 (45.0%)	0.042

Table 2 Activity categories

Activity	Examples of activities	Patients ( <i>n</i> = 597), <i>n</i> (%)	Sessions ( <i>n</i> = 3956), <i>n</i> (%)
Physical/exercise	"Will use exercise bike" "Attend exercise group twice this week" "Exercise at community center 3 times a week"	318 (53.3)	1265 (32.0)
Medication management	"Pt is evaluating her response to Rx" "Psycho-education: medication management" "Will explore option of free samples or drug company assistance"	243 (40.7)	882 (22.3)
Active–non-physical	"Writing poetry" "Elks club activities" "Resuming stained glass work"	304 (50.9)	743 (18.8)
Passive behaviors	"Reading" "Football on tv" "Listen to music"	234 (39.2)	533 (13.5)
Health-related behaviors	"Return to tennis if arm allows" "Chronic pain and illness class once a week" "See physical therapist about exercises for back"	206 (34.6)	505 (12.8)
Trip/vacation	"Trip to West Texas" "Upcoming trip to Italy" "Planning October trip to Lubbock"	195 (32.7)	431 (10.9)
Self-management	"Continue to use PST skills" "Anxiety management: deep relaxation breathing" "Relaxation techniques"	181 (30.3)	368 (9.3)
Religious/spiritual	"Meet with church people" "Church work with adolescents" "Anticipating: church on Sunday"	69 (11.6)	208 (5.3)
Holiday	"Family Thanksgiving at her home" "Anticipating: Thanksgiving with sister" "Family getting together for Thanksgiving"	122 (20.4)	167 (4.2)
Sleep	"Sleep hygiene" "Problem solving: sleep disturbance" "Focus on sleep which remains patient's biggest concern"	99 (16.6)	149 (3.8)
Obligatory	"Clean up house" "Worked in barns" "Household activities"	77 (12.9)	110 (2.8)
Preparatory behavior	"Patient to list more options" "Think of two more [activities]" "Try to think of others [activities]"	68 (11.4)	92 (2.3)
Work	"Looking for a part time job" "Work in gift shop of hospital" "Work in native plant facility once a week"	34 (5.7)	72 (1.8)
Pets	"Enjoys walking his dog" "Taking care of her birds daily" "Says she is considering adopting a cat from the shelter"	34 (5.7)	62 (1.6)
Education	"Painting class" "Go to a craft class" "Will go to sewing class this week"	39 (6.5)	55 (1.4)
Chemical dependency	"AA: plans to rejoin with wife" "Noon AA meetings twice a week" "AA meetings for mental and spiritual support"	20 (3.4)	42 (1.1)
Financial	"New goal is to understand finances" "Plans to resume money management course" "Meet with attorney several times this week regarding money from her parent's estate"	31 (5.2)	37 (0.9)

Activities that included interaction with family members were coded under the higher order category of family regardless of the type of activity. For example, "visiting grandchildren" was coded under "family" as opposed to socialize though the interaction is intended as an interactive activity.

Our analyses testing for association between activity scheduling and depression outcomes indicated that activity scheduling was associated with depression improvement (a 50% or greater improvement from baseline; odds ratio = 1.53, confidence interval = 1.144–2.054,  $\chi^2 = <0.01$ ; Table 4). Note that of the baseline variables

that differed between those with and without notes (Table 1), only age was significantly associated with improvement when the presence of scheduled activities was included in the multivariate testing of depression improvement. We found significant

associations between pleasant activity engagement and depression improvement indicating that the more active an individual was at 12 months, the more likely they were to have a clinically significant improvement (Table 5). We found similar associations between

Table 3 Frequencies of solitary versus social activities by patient and by session and association with depression improvement

Level of social engagement	Examples of activities	Patients ( <i>n</i> = 597), <i>n</i> (%)	Sessions ( <i>n</i> = 3956), <i>n</i> (%)	Association with 50% improvement
Solitary	"Yard work" "Write letter to brother" "Read"	455 (76.2)	1712 (43.3)	<i>p</i> = 0.38
Social for others	"Babysit grandkids" "Volunteer at Cajon Library" "Volunteer at school"	96 (16.1)	183 (4.6)	<i>p</i> = 0.43
Socialize	"Go to senior center" "Breakfast with friends" "Senior center for lunch"	211 (35.3)	422 (10.7)	<i>p</i> = 0.009
Family	"Spending time with family" "Errands with wife" "See grandkids"	279 (46.7)	727 (18.4)	<i>p</i> = 0.03
Social	"Playing cards on Tuesday" "Playing poker with girls" "Going to coffee shop"	358 (60.0)	1029 (26.0)	<i>p</i> = 0.20

Table 4 Association of 50% improvement with having a note documenting activity scheduling

Variable	Degree of freedom	Estimate	Standard error	Wald $\chi^2$	<i>p</i> (probability estimate for $\chi^2$ )
Intercept	1	2.2792	0.6836	11.1167	0.0009
With note	1	0.4272	0.1492	8.1966	0.0042
Age	1	-0.0398	0.00971	16.8052	<0.0001

Table 5 Association of having a note documenting activity scheduling, self-reported engagement in pleasant activities at 12 months and 50% or greater improvement in depression from baseline at 12 months

Variable	Odds ratio	95% confidence interval
I: Association of engagement <sup>a</sup> of pleasant activity with 50% improvement		
Occasionally	1.255	0.640–2.462
Half	1.189	0.614–2.301
Most	4.092	2.152–7.781
All	6.373	3.277–12.394
Age	0.963	0.944–0.983
II: Association of engagement <sup>a</sup> of pleasant activities and having an activity scheduling note during treatment		
Occasionally	1.356	0.730–2.517
Half	1.403	0.766–2.569
Most	2.635	1.418–4.899
All	1.785	0.959–3.321
Age	1.038	1.017–1.060
Female	1.628	1.181–2.245
Marital status	1.947	1.419–2.671
H.S. grad	2.348	1.629–3.383
ADD	0.729	0.540–0.984

<sup>a</sup>Engagement options, "not at all," "occasionally," "half," "most," and "all" are anchored to "how much time in the past month have you spent engaging in pleasant activities" assessed at 12 months. Reference value is "not at all."

H.S. Grad = at least high school graduate level of education. ADD = use of antidepressant medication at baseline.

having a care management note recording specific activity scheduling and self-reported level of engagement in pleasant activities at 12 months (Table 5).

To explore the potential relationship between social engagement and treatment outcomes, we performed Fisher's exact test using the types of social engagement identified in our qualitative analyses (solitary, socialize, social, family, and social for others) as predictor variables (Table 3).

## Discussion

Older primary care patients receiving care management for depression in the IMPACT trial worked on a wide range of social and solitary activities during care management sessions. Overall, activities related to management of health, medical problems, and medications dominated the range of activities, probably reflecting the high level of chronic medical illness in this group (Unützer *et al.*, 2002).

There was a robust association between structured activity scheduling during treatment and self-reported activity engagement at 12 months as well as clinically significant improvements in depression. Using our higher order types of social engagement, we found that most patients engaged in a range of activities. There were significant associations between two of our derived categories, "Socialize" and "Family," with improved depression outcomes. This may reflect a value not only in social activity but specifically intentional socializing as well as interactions with family members. We note the primary difference between our Social category and Socialize category was explicit evidence in the treatment note that the focus was on being with others not just in the presence of others (e.g., going to a coffee house versus having coffee with friends).

## Limitations

Our quantitative analyses are derived from secondary analyses and hence should be considered exploratory. We interpreted a lack of noted activity scheduling in progress notes as evidence that activity scheduling was not emphasized during treatment. It is possible that it was emphasized but merely undocumented. No fidelity checks were conducted during the study period to insure that lack of documentation was definitive evidence of lack of behavioral activation support. The strong association between documented activity

scheduling and self-reported activity engagement at 12 months suggests, however, that "if it isn't documented, it may not be happening." However, our data do suggest that patients who had records of specific activities in their session note differed from those who did not in several aspects, suggesting that our results may not generalize to all subsets of depressed older primary care patients.

Patients were not randomly assigned to different types of activities and only focused on activities that they desired to discuss during sessions. Patients also had other treatments in addition to activity scheduling such as PST-PC and antidepressant treatment. These two limitations make it impossible to draw causal inferences about the nature of activities and clinical outcomes.

Understanding the relationship between activities targeted as part of depression care management and clinical outcomes could help guide future CMs and clinicians' decision making about how to guide activity scheduling for better depression outcomes.

## Conclusions

Although exploratory in nature, these observations suggest that there is a strong relationship between structured activity scheduling, and particularly activities in which social and family interactions are the focus, and clinical outcomes at the aggregated group level. These findings serve as a reference point for future investigations aimed at optimizing behavioral interventions for late-life depression, one of the most common and disabling conditions in older adults. For example, further research is warranted to explore if specific activities, which had a high frequency such as physical activity/exercise and medication management, are more efficacious at treating depression in older adults. The IMPACT trial utilized a "stepped-care" model of treatment attempting to deliver the least invasive and least resource intense interventions appropriate to level of depression. Theory would support refining the activity scheduling for those individuals who do not respond initially by identifying specific avoidance strategies and choosing activities to directly address avoidance patterns, and such an expanded form of behavioral activation should be tested in the context of care management for late-life depression.

In the meantime, CMs should focus on supporting broad range of activities driven by patient preference, including social and family activities.

### Key points

- Older primary care patients receiving care management for depression in the IMPACT trial were supported to engage in a wide range of social and solitary activities during care management sessions.
- Management of health, medical problems, and medications dominated the range of activities.
- There was a robust association between structured activity scheduling during treatment and self-reported activity engagement at 12 months as well as clinically significant improvements in depression.

### Conflict of interest

None declared.

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