Occupational Performance Coaching for Stroke Survivors: A Pilot Randomized Controlled Trial

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OBJECTIVE. We examined the feasibility of study procedures and explored the potential efficacy of Occupational Performance Coaching for stroke survivors (OPC–Stroke), an intervention designed to improve participation after stroke.

METHOD. In this pilot randomized controlled trial, 21 participants were randomized to receive the intervention or usual care. Recruitment, retention, and outcome completion rates were calculated. Direction of change and effect sizes were examined for the outcomes of participation, goal performance and satisfaction, goal self-efficacy, emotional well-being, and cognition.

RESULTS. Rates of recruitment (66%) and retention (81%) were satisfactory. Participation scores improved for both groups with different trajectories. Results showed a moderate effect of OPC–Stroke for goal performance ($\eta^2_{partial}$ d = .075) and satisfaction ($\eta^2_{partial}$ d = .078) and a large effect for cognition ($\eta^2_{partial}$ d = .167). Other outcome measures did not change as expected.

CONCLUSION. Study procedures were generally feasible. Preliminary findings support testing to examine the efficacy of OPC–Stroke.

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The majority of stroke survivors, even those with mild stroke, report reduced participation (Hartman-Maeir, Soroker, Ring, Avni, & Katz, 2007; Public Health Agency of Canada, 2011). Despite the recognition of participation as an important outcome of stroke rehabilitation (Baum, 2011), few interventions are designed to address restricted participation for people after stroke. The most successful interventions tested to date have included client goal setting, competency development, targeted information provision, emotional support, and efforts to empower the client (Desrosiers et al., 2007; Egan, Kessler, Laporte, Metcalfe, & Carter, 2007; Ertel, Glymour, Glass, & Berkman, 2007; Gilbertson, Langhorne, Walker, Allen, & Murray, 2000; Glass et al., 2004; Nour, Desrosiers, Gauthier, & Carbonneau, 2002). No intervention tested to date has integrated all of these components.

Occupational Performance Coaching adapted for stroke survivors (OPC–Stroke) is a complex intervention designed to improve engagement in occupation through provision of emotional support, individualized education, and metacognitive strategies during client goal setting and problem solving related to participation challenges. The theoretical basis of this intervention is described in detail elsewhere (Kessler, Ineza, Patel, Phillips, & Dubouloz, 2014). In brief, an occupational therapist coach encourages and guides stroke survivors to work toward the achievement of self-identified participation goals. Through the process of identifying and problem solving through small weekly goals, efforts are made to develop clients'

self-efficacy and problem-solving skills to manage participation challenges (Kessler, Ineza, et al., 2014).

In preliminary testing, OPC–Stroke was acceptable to participants and showed promise for improving participation and performance of identified goals (Belliveau, Belliveau, Camire-Raymond, Kessler, & Egan, 2016; Kessler, Egan, et al., 2014). The purpose of this study was to continue to explore the potential efficacy of OPC–Stroke and examine the feasibility of procedures that could be used in a full-scale randomized controlled trial (RCT). The hypotheses were as follows:

1. The study procedures are feasible as indicated by recruitment and retention rates, respondent outcome measure completion, and attendance.
2. Compared with those receiving usual care, participants receiving OPC–Stroke will
   - Report improved participation and
   - Experience increased performance and satisfaction with individually identified participation goals, emotional well-being, goal self-efficacy, and cognition.

Method

A single-blind pilot RCT was conducted; details of the protocol are described elsewhere (Kessler, Egan, et al., 2014). Participants were recruited after acute hospitalization, inpatient rehabilitation, or outpatient stroke rehabilitation. Participants were included in the study if they had been hospitalized for a first stroke, lived in a noninstitutional setting, required no more than moderate assistance with communication and problem solving on the basis of a clinical assessment, were not receiving ongoing occupational therapy, and did not have a degenerative neurological diagnosis or major depressive or psychotic disorder. The target was to recruit 24 stroke survivors.

After providing informed consent and completing the initial outcome measures, participants were allocated to the treatment (OPC–Stroke plus usual care) or control (usual care) group using block randomization (block size of 4) stratified by recruitment source (inpatient vs. outpatient). The randomization sequence was computer generated and concealed in opaque envelopes. Allocation was completed by research staff not associated with the study.

The OPC–Stroke intervention consisted of up to 10 sessions over 16 wk delivered in the participants' homes. Usual care could include therapy (excluding occupational therapy) or support for personal care.

Outcome Measures

Participation was measured using the Reintegration to Normal Living Index (RNLI; Wood-Dauphinee, Opzoomer, Williams, Marchand, & Spitzer, 1988). The RNLI measures satisfaction across a range of areas and is recommended as a client-centered measure of participation after stroke (Kessler & Egan, 2012). Performance of and satisfaction with participation goals were measured using the Canadian Occupational Performance Measure (COPM; Law, Carswell, McColl, Polatajko, & Pollock, 1998). Emotional well-being was measured using the Hospital Anxiety and Depression Scale (HADS; Zigmond & Snaith, 1983). Goal self-efficacy was measured using the Goals Systems Assessment Battery–Directive Functions Indicators (GSAB–DFI; Karoly & Ruehlman, 1995). Cognition was measured using the Montreal Cognitive Assessment (MoCA; Nasreddine et al., 2005). All outcome measures have acceptable reliability and validity and, with the exception of the GSAB–DFI, have been tested with people who have experienced stroke, as described in the study protocol (Kessler, Egan, et al., 2014).

Data Collection

Recruitment and retention rates were tracked, and missing outcome data, session attendance, and maintenance of blinding were examined. Baseline assessment included two sessions. First, a research assistant, masked to group assignment, completed pretest outcome measures: RNLI, HADS, and MoCA. Then, the occupational therapist coach administered the COPM and the GSAB–DFI to participants in both groups. At posttest and 6 mo later, the research assistant readministered all evaluations.

Analysis

Recruitment, retention, and attendance rates were calculated and outcome measure completion and performance examined. Maintenance of blinding was calculated by determining the agreement between the research assistant's guess of group allocation at follow-up and actual allocation, corrected for chance using κ (Viera & Garrett, 2005).

We used t tests and Fisher's exact tests to identify group baseline differences. Mean scores for participation, performance and satisfaction with identified goals, emotional well-being, goal self-efficacy, and cognition for each time point, with 95% confidence intervals, were examined for direction of change. A repeated measures analysis of variance (ANOVA; Park, Cho, & Ki, 2009) with partial η^2 for effect size was calculated to provide an estimate of the magnitude of any differences. An effect size of .01 was considered small; .06, medium; and .14, large (Kyngäs, Kroll, & Duffy, 2000; Norman & Streiner, 2008). Before analysis, data were examined for

normal distribution using the Greenhouse–Geisser adjustment for sphericity (Keselman, 1998) as needed. Complete case analysis was used because of the small sample size and because data were deemed to be missing completely at random (Wood, White, & Thompson, 2004). IBM SSPS Statistics Version 22 (IBM Corp., Armonk, NY) was used to conduct the analysis. Ethical approval for this study was obtained from the relevant research ethics boards.

Results

Participants

Of 32 people identified as eligible for the study between January 2013 and May 2014, 21 (65.6%) agreed to participate. No significant between-group differences were noted at baseline for demographic variables (Table 1). Although the average time after stroke was larger in the control group, these results were largely driven by one participant who was 330 wk poststroke.

Overall retention for the study was high (81%; Figure 1). After randomization, it was discovered that one person in the control group had another neurological diagnosis. In keeping with the intention-to-treat paradigm and the pilot nature of this study, this person was retained in the analysis.

Table 1. Participants' Demographic Characteristics at Baseline

	Control Group (N = 11)		Intervention Group (N = 10)		
Variable	*M* (*SD*)	*n*	*M* (*SD*)	*n*	*p*
Age	64.9 (16.3)	11	71.0 (13.2)	10	.361
Discharge FIM™ score	109.1 (7.1)	8	105.6 (13.2)	8	.522
Weeks poststroke	60.6 (87.6)	11	29.2 (18.2)	10	.271
No. of comorbidities	4.1 (1.6)	11	4.1 (2.3)	10	.992
	n (%)		*n* (%)		Fisher's exact
Gender, male	6 (55)		5 (50)		.670
Side of stroke					—
Left	4 (36)		2 (20)		
Right	5 (46)		7 (70)		
Bilateral	2 (18)		1 (10)		
Stroke type					.476
Clot	9 (82)		10 (100)		
Hemorrhage	2 (18)		0 (0)		
Living situation					1.000
Alone	4 (36)		4 (40)		
Spouse or family	7 (64)		6 (60)		
Other services					
Personal care	3 (27)		3 (30)		1.000
Therapy	7 (64)		5 (50)		.670

Note. — = could not be tested with Fisher's exact test; *M* = mean; *SD* = standard deviation.

For the participants who completed the intervention, the average number of sessions was 8.6 (range = 6–11) carried out over 10–16 wk, with a mean of 13.75 wk. Participants completed most outcome measures without difficulty. However, 6 participants had difficulty scoring the GSAB–DFI at one time point and required instruction from the research assistant. The research assistant correctly guessed allocation of 3 of 6 participants in the intervention group and 9 of 11 in the control group (κ = .33).

Potential Efficacy

Mean scores for all outcomes are provided in Table 2. The results for the repeated measures ANOVA are presented in Table 3.

The effect size for participation (RNLI) suggests a medium Time × Group effect. The trajectory of participation was different between the groups, with the intervention group starting higher, decreasing at posttest, and then increasing to above baseline at follow-up. The control group started with a lower score at baseline and gradually improved. Goal performance and satisfaction scores (COPM) indicate a medium Time × Group effect that favored the intervention group. These scores also increased significantly over time in both groups (p < .001). Effect sizes for emotional well-being (HADS) and goal self-efficacy (GSAB–DFI) indicated no effect of the intervention. A large effect size that favored the intervention group was noted for cognition (MoCA).

Discussion

The objective of this study was to pilot procedures before undertaking a full-scale trial and explore the potential efficacy of OPC–Stroke for the selected outcomes. Overall recruitment and retention rates and attendance patterns were acceptable. Although the intervention group lost more participants to follow-up, only 1 of these was related to the intervention. A larger study should plan for 20% attrition. Outcome measures were generally acceptable and well completed, although clear instructions for scoring the GSAB–DFI were needed. Evaluator masking was maintained through allocation processes.

Contrary to the original hypothesis, OPC–Stroke was not clearly associated with improvement in overall participation as measured using the RNLI. Findings for the RNLI indicate a medium effect size between groups. However, the meaning of this difference is difficult to interpret given the different trajectory of means in each group. The drop in scores for the intervention group at posttest may indicate that the intervention as provided

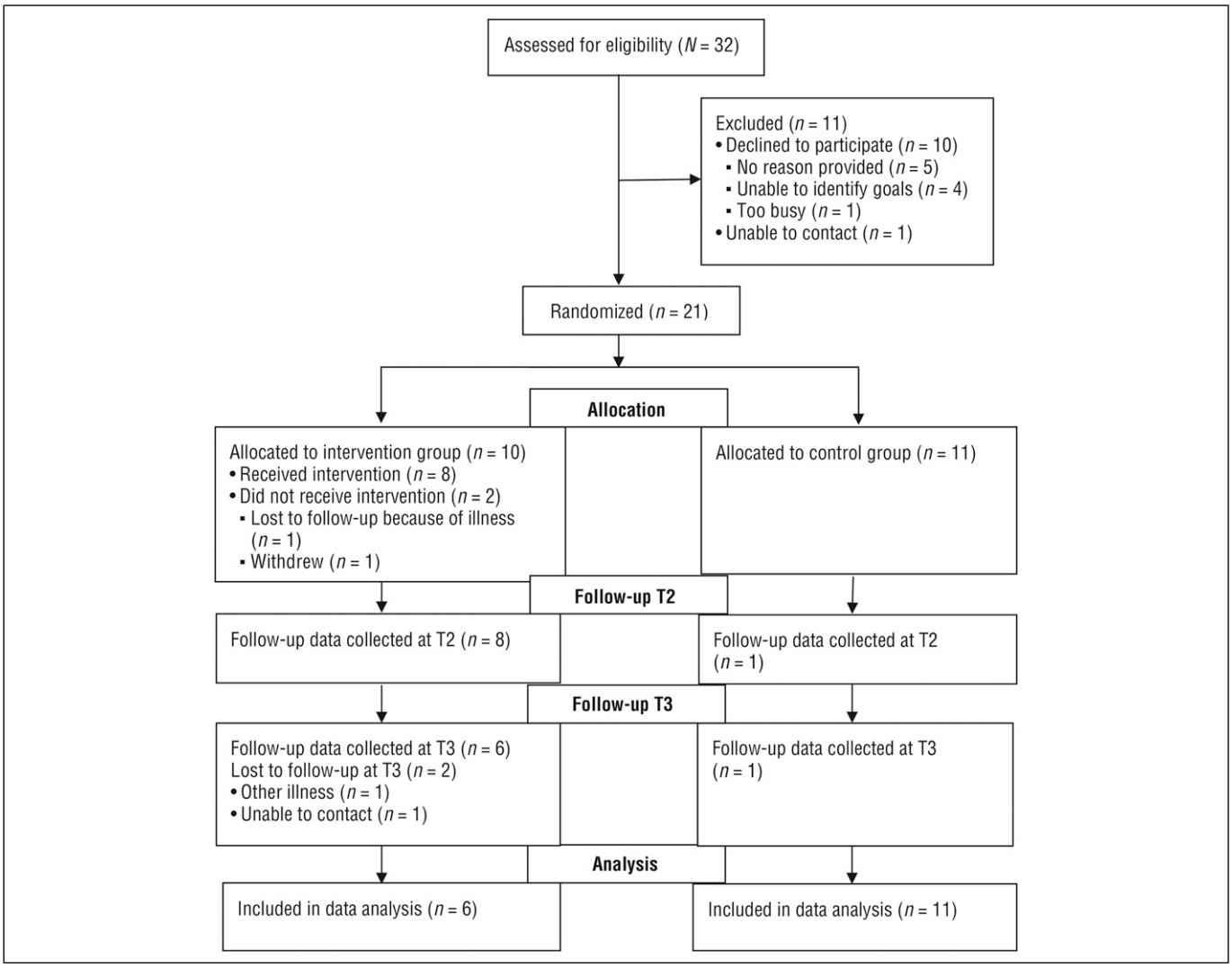

Figure 1. Flow diagram of participant allocation (format from Moher et al., 2010).
Note. T2 = posttest; T3 = 6-mo follow-up.

does not contribute to improvement in participation. However, measurement issues may also have influenced this finding.

The high initial RNLI pretest score for the intervention group (92/110) compared with the control group (79/110) may have left little room for the intervention group to show improvement. In addition, theoretically, some intervention participants may have experienced low satisfaction with participation because their high initial expectations for progress toward their goals were not met because of challenges they faced in working toward their goals, leading them to rate themselves as less satisfied with postintervention participation. Although self-reported measures are useful for capturing the participant perspective, they are susceptible to response shift when expectations change (Barclay-Goddard, Lix, Tate, Weinberg, & Mayo, 2009).

Although the RNLI has been identified as a preferred measure of participation because it explores a broad range of participation areas (Kessler & Egan, 2012), it captures only participant satisfaction with participation. Participation is a complex construct to define and measure (Hammel et al., 2008; Whiteneck & Dijkers, 2009). Therefore, a composite outcome that includes objective aspects of performance may more accurately measure participation changes.

Consistent with the study hypotheses, study participants improved in perceived performance and satisfaction with performance on identified goals as measured by the COPM. The moderate effect size supports further testing.

Notably, the control group also made progress toward goals. The act of reflecting on and selecting personally valued goals with the occupational therapist may have prompted participants to take action toward achievement of goals. Consistent with this finding, a study exploring goal achievement 6 mo after inpatient stroke rehabilitation ($n = 45$) found that 20% of participants achieved all goals and 73% achieved some goals set with a health care

Table 2. Outcome Measure Scores Over Time

Outcome Measure and Group	Pretest *M* [95% CI]	Posttest *M* [95% CI]	Follow-up *M* [95% CI]
RNLI			
OPC–Stroke	92.0 [74.9, 109.1]	84.7 [62.9, 106.5]	95.2 [80.2, 110.2]
Usual care	79.0 [67.3, 90.9]	86.7 [74.3, 99.1]	88.7 [80.7, 96.6]
COPM Performance			
OPC–Stroke	3.7 [2.1, 5.3]	6.3 [3.9, 8.8]	6.1 [4.1, 8.0]
Usual care	5.0 [3.4, 6.5]	6.3 [5.0, 7.7]	6.1 [4.2, 8.0]
COPM Satisfaction			
OPC–Stroke	2.7 [1.4, 4.0]	6.2 [4.0, 8.5]	5.6 [3.7, 7.5]
Usual care	4.1 [2.6, 5.6]	6.2 [4.8, 7.5]	5.7 [3.7, 7.6]
HADS			
OPC–Stroke	5.8 [1.5, 10.2]	7.7 [2.2, 13.1]	7.8 [1.6, 14.1]
Usual care	7.4 [5.3, 9.5]	10.0 [5.4, 14.6]	9.6 [6.1, 13.2]
GSAB–DFI			
OPC–Stroke	23.4 [20.1, 26.7]	23.8 [20.8, 26.9]	23.0 [17.3, 28.6]
Usual care	25.0 [22.1, 27.8]	24.4 [22.4, 26.5]	24.0 [21.7, 26.2]
MoCA			
OPC–Stroke	26.2 [23.7, 28.6]	26.8 [24.7, 29.0]	28.2 [26.2, 30.1]
Usual care	25.7 [24.0, 27.5]	26.7 [25.4, 28.0]	25.9 [24.1, 27.7]

Note. CI = confidence interval; COPM = Canadian Occupational Performance Measure (score range = 1–10; higher scores indicate better performance or satisfaction); GSAB–DFI = Goals Systems Assessment Battery–Directive Functions Indicators (score range = 0–32; higher scores indicate higher goal self-efficacy); HADS = Hospital Anxiety and Depression Scale (score range = 0–42; higher scores indicate higher anxiety and depression); *M* = mean; MoCA = Montreal Cognitive Assessment (score range = 0–32; higher scores indicate better cognition); OPC–Stroke = Occupational Performance Coaching for stroke survivors; RNLI = Reintegration to Normal Living Index (score range = 1–110; higher scores indicate better participation).

professional at the end of inpatient rehabilitation, without therapy (Brock et al., 2009). Findings support the assertion that goal setting is a positive component of stroke rehabilitation. Establishing participation goals with an occupational therapist may also have mitigated a tendency for family members to overprotect stroke survivors that inadvertently limits their participation (Pound, Gompertz, & Ebrahim, 1998; Wood, Connelly, & Maly, 2010).

Table 3. Repeated Measures Analysis of Variance Results

Measure	*F (df)*	*p*	$\eta^2_{partial}$	Observed Power
RNLI				
Time	1.566 (1, 446)	.231	.095	.258
Time × Group	1.680 (1, 446)	.212	.101[a]	.274
COPM Performance				
Time	10.537 (2)	<.001	.413	.981
Time × Group	1.219 (2)	.310	.075[a]	.245
COPM Satisfaction				
Time	15.734 (2)	<.001	.512	.999
Time × Group	1.268 (2)	.296	.078[a]	.254
HADS				
Time	2.553 (1, 353)	.117	.145	.378
Time × Group	0.067 (1, 353)	.868	.004	.058
GSAB–DFI				
Time	0.317 (2)	.731	.021	.096
Time × Group	0.115 (2)	.819	.008	.066
MoCA				
Time	2.914 (2)	.070	.163	.526
Time × Group	3.005 (2)	.065	.167[b]	.540

Note. COPM = Canadian Occupational Performance Measure; *df* = degrees of freedom; GSAB–DFI = Goals Systems Assessment Battery–Directive Functions Indicators; HADS = Hospital Anxiety and Depression Scale; MoCA = Montreal Cognitive Assessment; OPC–Stroke = Occupational Performance Coaching for stroke survivors; RNLI = Reintegration to Normal Living Index. [a]Medium effect size. [b]Large effect size.

Contrary to the hypothesis, OPC–Stroke did not lead to improved emotional well-being. Although participation, goal performance, and satisfaction with goal performance improved to varying degrees in both groups over time, emotional well-being decreased in both groups. Several participants experienced other events in their lives (e.g., illness or death of a loved one) that would be expected to have an impact on their emotional well-being and therefore could have influenced this outcome for both groups.

Goal self-efficacy scores indicated a moderate level of goal self-efficacy at baseline that did not change over time in either group. Given that self-efficacy beliefs have been tied to goal achievement (Bandura, 1977), it was expected that goal self-efficacy scores would increase in conjunction with increased scores for goal performance and satisfaction. It could be that participants' moderate level of initial self-efficacy was sufficient to promote action toward goals.

The large effect size for cognition favoring the OPC–Stroke group supports the hypothesis that OPC–Stroke improves cognition. This change could be the result of training in metacognitive strategies that are incorporated

into OPC–Stroke through the goal-setting and problem-solving processes. Findings from a systematic review of the evidence for cognitive rehabilitation after traumatic brain injury and stroke indicate that interventions that incorporate training in metacognitive strategies can lead to improvement in attention, memory, language deficits, and social skills (Cicerone et al., 2011). Further research to test the potential for OPC–Stroke to improve cognition using more fine-grained cognitive assessment tools is recommended.

Limitations

Because of the small sample size, the study findings must be interpreted with caution; estimates of effect may be quite unstable. Consistent with many rehabilitation RCTs, it was not possible to double blind within the study design by masking the person administering the intervention, and delivering a sham control treatment to mask participants was problematic.

The use of goal setting with both the intervention and control groups presents challenges to identifying the impact of OPC–Stroke versus usual care. Arguably, one could say that this study compared OPC–Stroke to facilitated goal setting. Future studies of the efficacy of OPC–Stroke could include three arms, one of which does not include goal setting.

The MoCA is a cognitive screening tool chosen to explore the potential impact of OPC–Stroke on cognition without overly burdening participants. Further testing using more in-depth cognitive assessment tools is needed.

Participants in this study tended to have had mild strokes. Although research shows that people with mild stroke experience participation challenges, strategies to recruit participants experiencing a broader range of stroke severity should be considered for future testing of OPC–Stroke.

Implications for Occupational Therapy Practice

OPC–Stroke incorporates components of emotional support, individualized education, and goal-focused problem solving. These components appear to be important for interventions that target participation. The findings of this study have the following implications for occupational therapy practice:

- Although OPC–Stroke appears to be promising for promoting improved performance and satisfaction with performance of self-identified goals and cognition, more research is needed to prove its efficacy.
- Goal setting with a health care professional may, by itself, promote goal attainment for people living with stroke.

Conclusion

OPC–Stroke is a complex intervention designed to increase participation in valued activities. The findings of this study suggest that OPC–Stroke may help participants move toward achievement of individual participation goals while promoting cognitive abilities. Insights and findings from this study will inform the planning for further testing of OPC–Stroke. ▲

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