Incorporating a Cognitive Strategy Approach into an Outpatient Stroke Physiotherapy Programme: Case Report

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ABSTRACT

Purpose: Cognitive Orientation to daily Occupational Performance (CO-OP) has demonstrated an effect on skill performance, compared with the usual outpatient rehabilitation, in people living with stroke when implemented by occupational therapists. This study explored refining CO-OP for delivery by both occupational therapists and physiotherapists. **Client Description:** Two cases were recruited and treated using the CO-OP approach, which augments task-specific training with cognitive strategies and guided discovery. **Intervention:** Case 1 was a 79-year-old woman, 31 days after parietal stroke, and Case 2 was a 45-year-old man, 62 days after bilateral brain stem stroke. Case 1 withdrew from the study for medical reasons. Outcome measures applied were the Canadian Occupational Performance Measure, the Stroke Impact Scale (SIS), the Self-Efficacy Gauge, the Berg Balance Scale, the Box and Block Test, and the 2-minute walk test. **Measures and Outcomes:** After 10 sessions, Case 2 made gains in most measures, including a 22-point gain in the SIS mobility domain. **Implications:** The therapists reported that the combined delivery required additional communication with the patients but was feasible. Case 2 reported physical and mobility gains larger than the mean changes seen in past CO-OP research. Although these results cannot be generalized, findings suggest that the inter-professional application of CO-OP warrants further investigation.

Key Words: Cognitive Orientation to daily Occupational Performance; mobility limitation; rehabilitation; stroke; treatment outcome.

RÉSUMÉ

Objectif: appliquée par des ergothérapeutes, l'approche CO-OP (*Cognitive Orientation to daily Occupational Performance*) est plus efficace que la réadaptation habituelle en milieu ambulatoire pour améliorer la fonction des personnes ayant subi un accident vasculaire cérébral (AVC). Cette étude porte sur l'amélioration de l'approche CO-OP exécutée en parallèle par des ergothérapeutes et des physiothérapeutes. **Description du client :** nous avons recruté deux personnes que nous avons traitées à l'aide de l'approche CO-OP, qui complète les exercices traditionnels par des stratégies cognitives et de découverte guidée. **Intervention :** le premier cas était celui d'une femme âgée de 79 ans victime d'un AVC au lobe pariétal 31 jours auparavant, et le deuxième cas, celui d'un homme âgé de 45 ans victime d'un AVC bilatéral du tronc cérébral 62 jours auparavant. Le premier cas s'est retiré de l'étude pour des raisons médicales. Nous avons mesuré les résultats à l'aide de la mesure canadienne du rendement occupationnel (COPM), de l'échelle d'évaluation de l'impact de l'AVC (SIS), de l'échelle d'évaluation du sentiment d'efficacité personnelle (*Self-efficacy Scale*), de l'échelle de l'équilibre de Berg, du test « Boîte et blocs » et du test de marche de 2 minutes. **Mesures et résultats :** après 10 séances, le deuxième cas avait réalisé des gains dans la plupart des mesures, dont un gain de 22 points à l'échelle SIS pour la mobilité. **Implications :** les thérapeutes ont indiqué que la prestation en parallèle nécessitait davantage de communication avec le patient, mais était faisable. Les gains physiques et de mobilité chez le deuxième cas sont supérieurs aux changements moyens observés lors d'études antérieures sur l'approche CO-OP. Même si on ne peut généraliser les résultats, l'application interprofessionnelle de l'approche CO-OP mérite davantage de recherche.

The approach known as Cognitive Orientation to daily Occupational Performance (CO-OP) is associated with skill acquisition and retention, generalization, and transfer of skills beyond the rehabilitation setting in adults with stroke,^{1–3} including in comparison with control

groups.^{4,5} In a randomized controlled trial that our group conducted, CO-OP was implemented by an occupational therapist.^{5,6} The results were favourable: The participants who received CO-OP in place of the usual occupational therapy showed a large effect on skill performance

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at follow-up compared with the usual-care control group. However, the effect of CO-OP on mobility and physical function was small, raising the question of whether having physiotherapists also use CO-OP might lead to better performance across a wider range of outcomes.

PURPOSE

With the primary objective of refining CO-OP for use by both occupational therapists and physiotherapists in a usual-care outpatient department, we conducted two iterative, single-case studies, combined with knowledge sharing and research team consensus. The following two questions were posed: (1) What refinements to CO-OP are required for combined occupational therapy and physiotherapy application in an outpatient stroke programme and (2) what changes occur in the individual patient participants in goal performance, health status, arm and hand function, walking, and balance after combined occupational therapist and physiotherapist use of CO-OP? Treatments were conducted by a licensed occupational therapist (DC), previously trained in CO-OP, and a physiotherapist (BL), both employed by Sunnybrook—St. John's Rehab (SSJR). Research ethics board approval was obtained from Sunnybrook Health Sciences Centre, and informed consent was obtained from the participants.

Procedures

First, a physiotherapist was trained in CO-OP. The research team then worked together to propose refinements to CO-OP for integrated use by occupational therapy and physiotherapy in the existing outpatient programme at SSJR. Case 1 was recruited, and an occupational therapist and physiotherapist used the adapted CO-OP protocol.

The adapted CO-OP protocol was further refined on the basis of their experience with Case 1. Case 2 was then recruited, and both an occupational therapist and a physiotherapist used CO-OP with that case.

INTERVENTION

CO-OP is a client-centred, performance-based, problem-solving approach that has seven key features, including client-chosen goals, dynamic performance analysis, use of cognitive strategies, and guided discovery. Details of the approach are available in a textbook.⁷ Initially, the client and the therapist work together using the Canadian Occupational Performance Measure (COPM)⁸ to select at least three goals, which become the focus of treatment. Next, the client is taught the global cognitive strategy Goal–Plan–Do–Check, which is then used in subsequent sessions as the main problem-solving framework. The client identifies a goal, is guided by the therapist to discover a plan to achieve the goal, does the plan, and then checks to see whether it worked.

If the goal is not achieved, the therapist uses guided discovery to teach the client to review the plan and analyze performance problems. Using guided discovery, the therapist asks the client questions rather than explicitly telling

her or him what to do. For example, a client learning to walk without a cane after a stroke (goal) may consider several potential plans: He may decide to lift his knee higher to avoid having his toe catch (body position strategy), walk more slowly (task modification strategy), or tell himself to look ahead (verbal self-guidance or attentional focus strategy). During the do step, strategies are tried one at a time and monitored for effectiveness (check). After the check step, the client may make modifications to the plan and then repeat the process until the skill is performed satisfactorily.

MEASURES AND OUTCOMES

The primary outcomes were changes in the performance of self-selected skills, as measured by the COPM,⁸ and changes in health status, as measured by the Stroke Impact Scale (SIS).⁹ Secondary outcomes were self-efficacy (measured by the Self-Efficacy Gauge),¹⁰ arm and hand function (Box and Block Test, or BBT),^{11,12} gait (2-minute walk test),¹³ and balance (Berg Balance Scale, or BBS).¹⁴ The COPM, 2-minute walk test, and BBS were administered as part of the usual outpatient assessment; a research assistant administered the other tests.

Participants

Case 1 was a 79-year-old woman, 31 days post-right parietal infarct on admission to outpatient rehabilitation. She had mild aphasia, mild cognitive impairments, an admission FIM¹⁵ score of 103/126, and Chedoke-McMaster Stroke Assessment Impairment Inventory¹⁶ scores of 4/7 for the left arm, hand, leg, and foot. Our experience with Case 1 allowed us to refine the team's application of CO-OP; however, she developed medical issues that required her to withdraw before post-intervention testing.

Case 2 was a 45-year-old man, 62 days post-bilateral brain stem stroke on admission to outpatient rehabilitation. He had left hemiparesis greater than right, mild aphasia, mild depression, and mild cognitive impairment. His admission FIM score was 92/126, and his Chedoke-McMaster Stroke Assessment Impairment Inventory scores were 4/7 for the left arm, hand, leg, and foot.

Refinements to CO-OP

We made a few adaptations to the CO-OP process before intervening with Case 1 and then again for Case 2. The therapists added a meeting to divide up the client-chosen goals after the occupational therapist had conducted the goal-setting interview. Session times were reduced to 30 minutes with each therapist to match what occurs at SSJR, rather than the typical 45- to 60-minute CO-OP sessions, and the therapists added brief meetings on the clients' therapy days to consolidate the physiotherapist's CO-OP training and discuss the clients' strategies.

Table 1 Baseline and Post-Intervention Scores for Self-Selected Goals

Goals	Baseline		Post-intervention	
	COPM-P	COPM-S	COPM-P	COPM-S
Lift 10-lb object from floor	8	7	10*	10*
Carry heavy grocery bag	8	7	9	9*
Walk through grocery store without holding cart	7	7	9*	10*
Carry items on stairs	6	6	10*	10*
Fasten buttons	6	6	10*	10*

* an improvement ≥ 2 points, considered clinically significant.

COPM = Canadian Occupational Performance Measure; P = COPM performance; S = COPM satisfaction.

Table 2 Baseline and Post-Intervention Scores for Health Status, Activity, and Impairment Indicators

Instrument	Baseline	Post-intervention	Change
SIS			
Strength	50	60	10
Memory and thinking	74	74	0
Emotion	60	49	-11
Communication	80	74	-6
ADLs/IADLs	60	70	10
Mobility	42	64	22*
Hand function	60	80	20
Participation/role function	42	42	0
Physical function (SIS-16)	51	72	21
Self-Efficacy Gauge	215	256	41†
BBT			
Right	37	45	8*
Left	27	37	10*
BBS	56	56	0
2-minute walk test	155	170	15*

* scores exceed the minimal detectable change. Values used are BBT (5.5), 2-minute walk test (13.4 m), SIS physical domains strength (24), SIS ADL/IADL (17.3), SIS mobility (15.1), and SIS hand function (25.9).

† change $>10\%$ (28 points).

SIS = Stroke Impact Scale; ADLs/IADLs = activities of daily living/instrumental activities of daily living; BBT = Box and Block Test; BBS = Berg Balance Scale.

The therapists reported that the combined occupational therapy and physiotherapy application of CO-OP worked well. The increased discussion regarding strategies allowed the transfer of effective strategies between goals. For example, in physiotherapy, Case 1 developed a verbal self-talk heel-toe strategy for walking to the mall; in occupational therapy, she was then guided to implement this same strategy while carrying items in the kitchen. On one hand, it was challenging for the therapists to incorporate the additional meetings into their routine practice because their days are fully scheduled, with little extra time; on the other hand, they found that their overall communication about the clients improved and was more focused on the clients' functional goals. The length of these meetings decreased over time until they became more manage-

able. In addition to the 30 minutes spent with the occupational therapist and physiotherapist, the clients spent an additional 30 minutes per day with occupational therapy and physiotherapy assistants; the therapists reported that this was challenging because the therapy assistants were not trained in CO-OP, and this may have reduced their reinforcement of the strategies.

Case 2 report

Case 2 visited the outpatient department approximately two times per week and visited occupational therapy and physiotherapy 10 times each. The pre- and post-intervention COPM scores for each of his five goals are displayed in Table 1. He showed clinically significant improvements (>2 -point change) in satisfaction with 5/5 goals and in his performance on 4/5 goals. Table 2 displays his pre- and post-intervention scores for all additional measures, showing at least a 10% change in five SIS domains and the Self-Efficacy Gauge as well as greater than minimal detectable changes in the SIS mobility domain, bilateral BBT scores, and 2-minute walk test. His BBS was at the maximum (56) at baseline, so no change could occur.

IMPLICATIONS

It was feasible for us to implement the combined occupational therapy and physiotherapy delivery of CO-OP in a real-world outpatient stroke rehabilitation programme, and it required surprisingly few refinements. Case 2 reported changes in the majority of outcomes, including 22- and 21-point gains in SIS mobility and SIS-16 (physical function composite score), respectively; these indicators had mean gains of 7 and 8 points, respectively, in a trial in which participants received usual physiotherapy, but CO-OP was administered by an occupational therapist only.⁶ Although the results from this uncontrolled single case cannot be generalized, the findings suggest that a more inter-professional approach and augmenting physiotherapy with cognitive strategies may significantly improve mobility outcomes for people living with the effects of stroke. Further investigation is warranted.

KEY MESSAGES

What is already known on this topic

In a randomized controlled trial, large improvements in skill performance were seen in people with stroke who received Cognitive Orientation to daily Occupational Performance (CO-OP) treatment delivered by occupational therapists and usual physiotherapy compared with those people who received usual occupational therapy and physiotherapy. However, the effect of CO-OP on mobility and physical function was small.

What this study adds

These case reports demonstrate that combined occupational therapy and physiotherapy delivery of CO-OP is feasible and may be associated with improvements in a broader range of outcomes than CO-OP delivered by occupational therapy only.

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