2017

Critically Appraised Paper for "Efficacy of occupational therapy for patients with Parkinson's disease: A randomized controlled trial"

Amber Zadravecz
Dominican University of California

Hannah Tashjian
Dominican University of California

Emily White
Dominican University of California

Stephanie Pawek
Dominican University of California

Kitsum Li
Department of Occupational Therapy, Dominican University of California

AOTA Critically Appraised Papers Series

Evidence Exchange

**A product of the American Occupational Therapy Association's Evidence-Based Literature Review Project*

CRITICALLY APPRAISED PAPER

Sturkenboom, I. M., Graff, M. L., Hendriks, J. M., Veenhuizen, Y., Munneke, M., Bloem, B. R., & der Sanden, M. N. (2014). Efficacy of occupational therapy for patients with Parkinson's disease: A randomised controlled trial. *Lancet Neurology, 13*(6), 557–566. https://doi.org/10.1016/S1474-4422(14)70055-9

CLINICAL BOTTOM LINE

Parkinson's disease is a disabling, progressive condition that hinders occupational performance in daily activities and social participation. Occupational therapy supports engagement in activities that are meaningful to the patient. The purpose of this study was to explore the benefits of occupational therapy in addition to standard care for patients with Parkinson's disease.

Patients with mild Parkinson's disease were randomly assigned to a home-based occupational therapy intervention group or a control group. In the intervention group, occupational therapists delivered 10 weeks of home-based therapy aligned with Dutch practice guidelines. Individualized therapeutic interventions reflected each patient's prioritized activities of daily living. Patients in the control group received usual Parkinson's care in the context of the Netherlands health care system, but no occupational therapy.

The Canadian Occupational Performance Measure (COPM) was the primary assessment used to measure levels of satisfaction and perceived performance in both groups. The reported outcomes of the COPM showed significant improvement in self-perceived performance for the intervention group compared with the control group. The patients and caregivers in the intervention group reported a high satisfaction rate for the occupational therapy intervention. The caregiver assessment using the coping competence scale did not reveal significant changes for the caregivers in either group. However, given that the majority of the sample population had mild Parkinson's disease, patients' perceived improvements in satisfaction and performance of activities in the intervention group may not be reflective of patients in other stages of the condition. Furthermore, the context of the Netherlands health care system may affect the transfer of the results to practices in other countries.

This study was adequately powered, with a sample of 191 participants and 180 caregivers. Because there were no major flaws in this study, the findings of increased independence in daily activities after home-based occupational therapy can be considered statistically strong.

Hence, this study provides evidence that home-based occupational therapy may be an effective intervention for improving perceived occupational performance among patients with mild Parkinson's disease.

RESEARCH OBJECTIVE(S)

Evaluate the effectiveness of occupational therapy intervention in improving perceived performance of daily activities for patients with Parkinson's disease and lowering caregiver burden

DESIGN TYPE AND LEVEL OF EVIDENCE

Level I: Randomized controlled trial

PARTICIPANT SELECTION

How were participants recruited and selected to participate?

Potential patients at 10 hospitals in the United Kingdom received a letter inviting them to participate in the study. Interested patients contacted the researchers and were interviewed to ensure that their diagnosis matched the United Kingdom Brain Bank Criteria for Parkinson's disease. During the phone call, the occupational therapists provided detailed information regarding the trial and screened the patients using the established inclusion and exclusion criteria.

Inclusion criteria:

Patients had to have been diagnosed with Parkinson's disease according to the United Kingdom Brain Bank criteria, be currently living at home, and report difficulties with meaningful daily activities.

Exclusion criteria:

Patients were excluded if they had a diagnosis of atypical parkinsonism, had received occupational therapy in the previous 3 months, had a significant comorbidity, had poor knowledge of the Dutch language, or scored less than 24 on the Mini-Mental State Examination.

PARTICIPANT CHARACTERISTICS

N=	191

#/ % Male:	119/(62%)	**#/ % Female:**	72/(38%)

Ethnicity:	Not Reported

Disease/disability diagnosis:	Parkinson's disease

INTERVENTION AND CONTROL GROUPS

Group 1: Intervention group

Brief description of the intervention	Patients in the intervention group received home-based occupational therapy aligned with Dutch practice guidelines and had access to usual care provided by the Netherlands health care system. Interventions reflected individual priorities and needs related to activities of daily living and caregiver needs. Therapeutic interventions included skills training, compensatory strategies to enhance occupational performance, task simplification, adaptation of daily routines, and environmental modifications to improve safety and independence.
How many participants in the group?	124 patients with Parkinson's disease were randomly assigned to the experimental group; 121 patients completed the intervention
Where did the intervention take place?	Patient's home
Who delivered?	Occupational therapists
How often?	Not specified
For how long?	The length of sessions varied according to the complexity of the patient's needs. Each session was approximately 1 hour. Patients could receive a maximum of 16 hours of therapy over the course of 10 weeks.

Group 2: Control group

Brief description of the intervention	Patients in the control group received usual care for Parkinson's disease in the context of the Netherlands health care system and did not receive occupational therapy.
How many participants in the group?	67 patients with Parkinson's disease were randomly assigned to the control group; 57 patients adhered to the control conditions
Where did the intervention	Not reported

take place?	
Who delivered?	Various trained professionals working in the community in the health care system
How often?	Not specified
For how long?	Patients received usual care for the duration of the 10-week study.

INTERVENTION BIASES

Contamination:

YES ☒ NO ☐	*Explanation:* Three patients in the control group received occupational therapy as a result of inpatient admission and day-care treatment.

Co-intervention:

YES ☒ NO ☐	*Explanation:* Patients and caregivers in the intervention group and control group were permitted to receive medical, psychosocial, physiotherapy, or allied health care interventions during the study. The number of patients who received physiotherapy was similar in both groups. Parkinson's disease drug use, levodopa-equivalent dose, was higher among patients in the intervention group compared with the control group, but the mean difference in levodopa-equivalent dose was similar at baseline, 3 months, and 6 months.

Timing of intervention:

YES ☐ NO ☒	*Explanation:* Patients were assessed for an adequate period of time to allow for changes in perceived occupational performance.

Site of intervention:

YES ☒ NO ☐	*Explanation:* Home-based occupational therapy addressed the supports and barriers unique to each patient's home living situation.

Use of different therapists to provide intervention:

YES ☒ NO ☐	*Explanation:* This study did not specify whether the same occupational therapist consistently delivered intervention sessions for each patient over 10 weeks. The 18 occupational therapists who delivered the intervention received a minimum of 3 days of training specific to Parkinson's disease care and an additional day of training midway through the study.

Baseline equality:

YES ☒ NO ☐	*Explanation:* Patients' gender, age, and duration of Parkinson's disease were similar, and the majority of the patients were in the mild stage of the disease.

MEASURES AND OUTCOMES

Measure 1: COPM Performance scale and Satisfaction scale

Name/type of measure used:	COPM Performance scale and Satisfaction scale		
What outcome is measured?	Patients' self-perceived performance of and satisfaction with prioritized activities		
Is the measure reliable (as reported in the article)?	YES ☐	NO ☐	Not Reported ☒
Is the measure valid (as reported in the article)?	YES ☐	NO ☐	Not Reported ☒
When is the measure used?	At baseline, 3 months, and 6 months		

Measure 2: Perceive, Recall, Plan, Perform System Phase I

Name/type of measure used:	Perceive, Recall, Plan, Perform System Phase I		
What outcome is measured?	Patients' daily activity performance		
Is the measure reliable as reported in the article?	YES ☐	NO ☐	Not Reported ☒
Is the measure valid as reported in the article?	YES ☐	NO ☐	Not Reported ☒
When is the measure used?	At baseline and 3 months		

Measure 3: Activity Card Sort

Name/type of measure used:	Activity Card Sort

What outcome is measured?	Patients' perceived performance of activities		
Is the measure reliable as reported in the article?	YES ☐	NO ☐	Not Reported ☒
Is the measure valid as reported in the article?	YES ☐	NO ☐	Not Reported ☒
When is the measure used?	At baseline and 3 months		

Measure 4: Urecht Scale for Evaluation of Rehabilitation—Participation Satisfaction scale

Name/type of measure used:	Urecht Scale for Evaluation of Rehabilitation—Participation Satisfaction scale		
What outcome is measured?	Patients' participation in activities		
Is the measure reliable as reported in the article?	YES ☐	NO ☐	Not Reported ☒
Is the measure valid as reported in the article?	YES ☐	NO ☐	Not Reported ☒
When is the measure used?	At baseline, 3 months, and 6 months		

Measure 5: Fatigue Severity Scale

Name/type of measure used:	Fatigue Severity Scale		
What outcome is measured?	Effect of fatigue on patient		
Is the measure reliable as reported in the article?	YES ☐	NO ☐	Not Reported ☒
Is the measure valid as reported in the article?	YES ☐	NO ☐	Not Reported ☒

When is the measure used?	At baseline, 3 months, and 6 months

Measure 6: Zarit Burden Interview

Name/type of measure used:	Zarit Burden Interview		
What outcome is measured?	Self-perceived caregiver burden		
Is the measure reliable as reported in the article?	YES ☐	NO ☐	Not Reported ☒
Is the measure valid as reported in the article?	YES ☐	NO ☐	Not Reported ☒
When is the measure used?	At baseline, 3 months, and 6 months		

MEASUREMENT BIASES

Were the evaluators blind to treatment status?

YES ☒ NO ☐	*Explanation:* The occupational therapists were only assigned to the intervention group, so they were not blind to the trial. However, the trial was assessor masked. Patients were encouraged to maintain the masking of their assignment group, although in 18 of the 182 cases, the assessors were informed of the patient's status in intervention groups.

Was there recall or memory bias?

YES ☒ NO ☐	*Explanation:* The main assessment used to measure progress was the COPM, a tool requiring patients to recall their successes and satisfaction with participation in specific activities. Patients' recall of performance level might have been biased by personal expectations, understandings, and beliefs about adequate levels of performance.

Other measurement biases:

All assessments were self-perceived measures of performance and satisfaction. These measurements were ranked on numeric ordinal scales, with no specific measureable value or true zero to compare the scores or perceived improvement against other participants' scores. The reported levels of self-perception might have varied, depending on factors such as patient's or caregiver's mood, fatigue, pain level, or satisfaction with performance at the time of assessment administration.

RESULTS

The primary outcome measure reported was the COPM, and all other measures were secondary. The COPM measures reported at 3 and 6 months after baseline showed the intervention group with significantly better levels of self-perceived performance on prioritized activities compared with the control group ($p < .0001$). However, the mean differences between the intervention and control group became smaller over time ($p = .045$). The reported improvement level of at least 2 points' increase on the COPM at 3 months was greater in the intervention group than the control group (32% and 10%, respectively), which shows an increase in performance satisfaction for the intervention group. A decrease of 2 or fewer points reported on the COPM was small for both groups: 1% for the intervention group, and 3% for the control group. The overall outcomes for the caregivers were not significant regarding reduced level of burden. The mean grade of reported satisfaction with the occupational therapy intervention at 3 months was 8.1 out of 10 for the patients and 7.9 out of 10 for the caregivers.

Was this study adequately powered (large enough to show a difference)?

YES ☒ NO ☐	*Explanation:* The researchers completed a power analysis, and they aimed to have 192 participants for the study to be adequately powered, with an anticipated 10%–15% dropout rate. This study was adequately powered, with 191 patients and 180 caregivers. Only 9 participants and 14 caregivers dropped out (4% and 8% dropout rate, respectively).

Were the analysis methods appropriate?

YES ☒ NO ☐	*Explanation:* The researchers used linear mixed models (LMMs) to study the differences between groups for each outcome. LMM is adequate for comparing differences between participant groups. LMM is appropriate because the intervention group was twice as large as the control group. The researchers also used the Fisher's exact test to calculate the number of patients needed in each group to reach a clinically important change from the COPM baseline. These methods were appropriate because the Fisher's exact test is used to analyze contingency tables, it is valid for all sample sizes, and the deviation from the null hypothesis can be calculated exactly.

Were statistics appropriately reported (in written or table format)?

YES ☒ NO ☐	*Explanation:* The scores were written clearly, and the chart was organized in a categorical manner.

Was participant dropout less than 20% in total sample and balanced between groups?

YES ☒	*Explanation:* In the study, 3 patients in the intervention group and 6 patients in the control group dropped out because of a diagnosis of Hoehn

NO ☐	and Yahr Stage 3 or another, milder disease. Nine patients in total dropped out of a sample size of 191, making the dropout percentage about 4%. Fourteen caregivers were lost at the 6-month follow-up: 4 from the intervention group and 10 from the control group. The dropout rates were relatively balanced among the patients and caregivers.

What are the overall study limitations?

As reported in the study, one limitation is that the control group was not offered the intervention after the study, and therefore the researchers could not exclude the possibility of placebo effects contributing to the benefits experienced by the intervention group. They also used a referral process, which is not reflective of everyday clinical practice. This study focused on patients with mild Parkinson's disease, whereas most practicing clinicians typically treat patients with more advanced Parkinson's. Furthermore, the study was conducted under the assumption that all patients were receiving the usual Parkinson's disease care under the Netherlands health care system. Therefore, the findings cannot be transferred to different countries without a careful comparison of the typical treatment for patients with Parkinson's disease. A limitation the researchers did not identify was the uneven number of patients assigned to each group. The intervention group was twice as large as the control group, and the study did not report why the groups were unbalanced.

CONCLUSIONS

In this study, occupational therapy interventions, which were individualized for each patient with Parkinson's disease, supported the research hypothesis. The home-based interventions led to an improvement in perceived performance of daily activities within the duration of the study. Caregiver outcomes did not improve throughout the duration of the study, possibly because the assessments were not sensitive enough to assess caregiver outcomes. More research is recommended to identify what client factors, contextual factors, and therapeutic factors might predict which patients are more likely to benefit from occupational therapy.

This work is based on the evidence-based literature review completed by Amber Zadravecz, OTS, Hannah Tashjian, OTS, Emily White, OTS, Stephanie Pawek, OTS, and Kitsum Li, OTD, OTR/L, CSRS, faculty advisor, Dominican University of California.