Supplementary Table

Table S1: The Template for Intervention Description and Replication (TIDieR) Checklist

1. Brief name	An outpatient occupational therapy (OT) intervention in a multicentre cohort of neurorehabilitation patients.
2. Why	Neurological diseases are among the most frequent causes of disability worldwide. This group includes several conditions that affect independence in daily life, such as stroke, traumatic brain injury, brain tumour or neurodegenerative conditions. Many people suffering from neurological diseases have marked limitations in the performance of basic activities of daily living (ADL) and instrumental activities of daily living (IADL). Previous research has examined the effects of the OT interventions for people with neurological diseases, concluding that this treatment facilitates functional independence and improves the ability to perform ADL and IADL. However, several systematic reviews have highlighted that the evidence on this topic remains limited. In addition, the effects of the implementation of an outpatient modality of such programmes in a unit specialised in neurorehabilitation have been under-explored [1–5]. Based on the abovementioned findings, the aim of this study was to implement an outpatient OT intervention and monitor its effect on functional independence in a multicentre cohort of neurorehabilitation patients. The intervention followed the principles of a conceptual model for the practice of OT in people with physical dysfunction: *Occupational Functioning Model* (OFM) [6]. Main assumptions of the OFM: • Recovery goes beyond remediating impairments. OT focuses on problems related to the person´s occupational life. • People who are competent in their life roles experience a sense of self-efficacy and life satisfaction. • Life roles are classified into three domains: self-maintenance roles (ADL and IADL), self-advancement roles and self-enhancement roles. • The intervention process focuses on the interaction between the person and the environment. • The main objective of the OT treatment is to enable competent involvement in the valued tasks and activities of the patient´s life roles. According to the OFM, the OT intervention after injury or illness used several therapeutic mechanisms, as appropriate: • *Occupation-as-means* to optimise abilities and performance skills. • *Education*.

	• *Adjunctive therapies* to facilitate performance such as assistive devices and mobility aids. • *Contextual and environmental modification* to facilitate performance. • *Occupation-as-end* to restore daily functioning.
3. What – material	Learning labs: training in a homelike setting within the neurorehabilitation service (e.g. a fully equipped kitchen). The OT department of each hospital had the following learning labs: • A simulated room environment • A simulated bathroom environment • A simulated living room environment • A simulated kitchen environment The material used in the sessions included standard rehabilitation material (e.g. cones, balls and different types of daily objects). Ordinary daily objects related to the activity to be trained: a variety of objects were selected (e.g. household items). Use of "activity kits", as appropriate: • These kits are made up of the objects and utensils necessary to carry out a certain activity. • ADL and IADL training. • Examples: grooming kit and meal preparation kit. Assistive devices and adaptive equipment as needed.
4. What – procedures	Referral to OT is performed by a rehabilitation physician after assessing compliance with the following criteria: • Medically stable individuals. • Potential to improve functional independence, according to the physician's clinical judgement. • Cognitive skills to follow simple commands. The following were the inclusion criteria for the study: • Community-dwelling individuals aged ≥ 18 years. • A documented diagnosis of a neurological condition by a medical specialist as the main reason for referral to rehabilitation. • Medically stable. • Without drug and alcohol problems. • Admitted for outpatient treatment of OT. The aim of the OT intervention was to optimise the highest possible level of functional independence in daily life. This OT strategy focused on the performance of ADL and IADL.

According to the OFM, the OT process includes assessment, planning, treatment and reassessment.

4.1. *Assessment*

Before the beginning of the OT intervention, an initial assessment was conducted:

a) Abilities and performance skills:

- Manual muscle testing on selected muscle groups.
- Passive and active range of motion measurement (goniometer).
- Posture and postural alignment: observation.
- Sensory domain: tactile discrimination, temperature, pressure and proprioception. Testing techniques (non-standardised) and observation.
- Perception: object recognition, body schema, apraxia and spatial awareness. Testing techniques (non-standardised) and observation.
- Cognition: orientation, memory, attention and executive functions. Testing techniques (non-standardised) and observation.

b) ADL/IADL assessment:

- The participants established their needs and interests through a semi-structured interview, based on the Canadian Occupational Performance Measure.
- Functional independence in ADL: Barthel Index.
- Functional independence in IADL: Lawton Instrumental Activities of Daily Living Scale.

c) Home environment (barriers and enablers): semi-structured interview and use of photos and videos of the home environment.

4.2. *Planning*

After the assessment, short-term and long-term goals were set. The occupational therapist and the participant had to agree upon the goals.

Plan in collaboration with the person:

- Identify the tasks/activities that the patient wants to do or needs to do.
- The long-term goal is to enable competent involvement in the valued tasks and activities of the patient´s life roles.
- Establish short-term goals that directly relate to the long-term goal.

Models of practice include both remedial and compensatory approaches, as appropriate:

- Remediate, if required, impaired abilities and skills.
- Teach the patient adapted methods to accomplish the task/activity.
- Simplify/modify the home environment to allow the patient to perform the task/activity.

4.3. *Treatment*

Through a multicomponent approach, the OT treatment included an individualised combination of activities and techniques in the following domains:

4.3.1. *Occupation-as-means*

It is the use of occupation as a treatment to improve a person´s impaired abilities and performance skills. The patient engages in occupation-as-means to remedy or correct sensorimotor and cognitive abilities/skills that interfere with ADL/IADL. Examples:

- Repetitive tasks that prepare the person for function by improving trunk control (e.g. a task of folding towels).
- Daily activities (e.g. homemaking tasks) that are tailored to each individual to provide active movement.
- Crafts/arts to gain motor control (e.g. sewing).
- Simulated games/tasks that provide increasing levels of activity tolerance (e.g. inclined sanding, a basketball game).
- Daily tasks that provide activation of perceptual-cognitive skills.

In general, the intervention involved a task-based training approach.

- Use tasks/activities that are functional and preferably have meaning for the patient.
- Motor learning principles:
  -Neural reorganisation occurs secondary to the practice of goal-directed tasks/movements. Repetition.
  -Use of common objects.
  -Functional tasks: the practice of functional tasks improves motor behaviour.
- Guided movement, if required: the therapist places a hand over the patient´s hand to help him/her correctly manipulate objects.

Use of a variety of structured activities as a therapeutic intervention to improve/regain body skills, as appropriate:

- Functional posture and balance activities. Example: tasks that require both hands while sitting and standing.

- Body awareness. Use of both hands at the same time to help the person improve awareness of the involved side. Incorporate the weaker side into activities along with the stronger side. Examples: open screw-top containers and carry a laundry basket.
- Reach-grasp-hold-release activities (goal-directed).
- Somatosensory stimulation activities.
- Coordination and dexterity (e.g. prepare a light meal and origami tasks). Fine motor skills (e.g. picking up coins, use of a computer and shuffling and dealing cards).
- Endurance (e.g. vacuuming).
- Perceptual skills. Examples: cancellation and visual scanning tasks.
- Tasks that require cognitive skills such as memory, attention and orientation. Daily activities focused on improving problem solving.

Grading of the level of difficulty of the tasks/activities, according to different task/activity demands (e.g. number of steps required, objects, motor demands, sequence and level of cueing).

4.3.2. *Education*

Provision of education:

- Good body positioning: instruction and demonstration on proper positioning in chair, wheelchair and bed.
- Energy conservation and fatigue management techniques:
  -Use of ergonomics: good posture.
  -Optimal breathing patterns during the activities.
  -Planning ahead.
  -Prioritise and schedule daily activities.
  -Frequent rest breaks. Obtain a balance of activity and rest.
- Provide opportunities to use the affected arm throughout the day.
- Education concerning safety issues: fall risk and prevention strategies. Safe mobility.

4.3.3. *Adjunctive therapies*

Determine the person´s needs for assistive devices and adaptive equipment.

Recommend assistive devices/adaptive equipment as needed:

- Provide assistive devices that change bilateral activities into unilateral activities.
- These types of devices should be considered if they increase functional independence, simplicity and safety.
- Provide training in use of all prescribed equipment.
- Proper maintenance.

Examples:

- Mobility: cane, walker and wheelchair.
- Feeding: rocker knife, combined fork and spoon, universal cuff, large-diameter or built-up handles on utensils, buttering board, plate guard and nonslip mat under plate.
- Dressing: button hooks, dressing sticks, sock aid, long-handled shoehorns, and Velcro fasteners.
- Toileting: grab bars and raised toilet seat.
- Grooming: large-diameter or built-up handles on combs, brushes and shavers.
- Bathing/showering: shower chairs, bath/shower bench, liquid-soap dispenser and long-handled sponges.
- Meal preparation: built-up handles on utensils, adapted cutting boards, spike board, nonslip mat and one-handed jar opener.
- Housekeeping: long-handled tools, Reacher and lightweight mops.
- Cognitive deficits: electronic memory aids and personal digital assistants.

4.3.4. *Contextual and environmental modification*

Recommendation of home and environmental modifications, as needed, for example:

- Hand-held shower-head. Shower stall.
- Extended handles for faucets.
- Doorknob extensions.
- Installation of ramps.
- Elevator or lift.
- Stair glides.

The therapist assessed the needs for home adaptation to promote security and independence. The occupational therapist provided advice to participants about removal of architectural barriers.

4.3.5. *Occupation-as-end*

Occupation-as-end is an intervention focused on learning how to accomplish the tasks/activities that constitute the patient´s life roles in an adapted way. The therapist employs an adaptive approach that enables patients to accomplish the activities or tasks that a person sees as important.

This intervention used an individualised combination of several strategies to enable patients to participate in the desired roles by compensating for impairments:

- Modify or adapt the method to carry out the task, as needed:
  -Education of adapted/compensatory methods (e.g. use two hands for tasks ordinarily done one-handed).

-Adapted methods for persons with loss of the use of one side of the body. One-handed methods for activities ordinarily done two-handed.
-Adapt objects, tools and equipment.

- Use of assistive devices.
- Adapt/modify the environment.

Occupation-as-end strategies, as appropriate:

- Modify a task to make it easier to perform. Reduce or eliminate the need for fine-motor control.
- Provide instruction and demonstration in performing the activities:
  -Therapist: accurate feedback, clear explanations and suggestions for improvement. Hand-over-hand guidance.
  -Use of a mirror. Video recordings.
  -Use of step-by-step written directions. Cues and prompts as needed.
- Repetition (learning process).
- Safety issues (e.g. burns in the kitchen and water temperature).
- Visual aids: maps, calendar, checklists and diagrams.
- Assistive devices and environmental modifications. Examples: long-handled tools, power utensils and home adaptations. In the OT department, the patients were trained with the necessary assistive devices and adaptations.

On the basis of the specific needs concerning each subject, a training of daily life skills (ADL and IADL) was conducted under supervision of the occupational therapist:

- Teach, if required, methods for performing important activities, particularly if the patient expects to return to independent living.
- Repeated practice of activities that were adapted and graduated, with the aim of improving performance.
- The activities were adapted, graded and expanded as the patients gained competency.

4.4. *Reassessment*

The therapist continuously monitored the patient´s responses to the intervention and their progress toward the goals. Progress notes documented the examination of the patient´s progress toward treatment goals.

Daily contact notes: each time the patient was seen for treatment, the occupational therapist documented the contact (narrative notes).

At regular intervals, usually monthly, the therapist made decisions about the continuation or modification of the treatment.

Participants were discharged when they had met the OT goals or were no longer making progress.

5. Who provided	Referral to OT is performed by a rehabilitation physician. All rehabilitation physicians had more than 5 years of experience in rehabilitation of neurological disorders. Three occupational therapists (one therapist for each hospital) with more than 5 years of expertise in the field of neurorehabilitation conducted this intervention. All occupational therapy professionals held a bachelor degree qualification at minimum. These occupational therapists performed the assessments and were with the patients throughout all the intervention process.
6. How	All the sessions were provided individually and face-to-face. The intervention was delivered on a one-to-one basis to promote engagement and motivation with the intervention.
7. Where	The OT intervention was provided in an outpatient hospital setting. All intervention sessions were conducted at the regional reference neurorehabilitation services of three urban hospitals ascribed to the Spanish National Health Service: ➢ Lucus Augusti University Hospital, Lugo, Spain ➢ Ourense University Hospital Complex, Ourense, Spain ➢ Sant Joan De Déu Hospital, Palma de Mallorca, Spain Community neurorehabilitation refers to rehabilitation that occurs while the individual is living at home. It allows for earlier discharge from the hospital, facilitates additional therapy for people who do not require intensive hospitalisation, and provides periodic maintenance rehabilitation for people with progressive neurological conditions. All the assessment and intervention sessions were conducted within the OT department of the neurorehabilitation service.
8. When and how much	The OT interventions were conducted between March 2016 and October 2018. The duration (number of sessions a patient received) and intensity (duration / number of days between the first and last OT session) were recorded. The duration of the OT intervention was 32 sessions (median, Q1 – Q3 = 18 – 59) and its intensity was 0.25 (median, Q1 – Q3 = 0.16 – 0.37). The intervention sessions lasted about 30-45 minutes, with the average duration of each session being approximately 35 to 40 minutes. The intervention sessions were typically conducted from one to two times per week as determined by the therapist. Participants were discharged when they had met the OT goals or were no longer making progress.

9. Tailoring	A fundamental principle of the intervention was that it was individually tailored to the abilities, skills and goals of the patient. The intervention had a common base, including the four phases of the OT process according to the OFM. However, all participants received an individualised combination of all types of OT domains, adapted on a case-by-case basis. The OT intervention varied according to the patient´s stage of recovery, extent of impairment and the individualised profile of personal goals. The patient is central to all OT interventions: ✓ Client-centred approach: target the problems that are important to the client´s life. ✓ Collaborative goal setting is a crucial part of the OT process. Use of therapeutic methods appropriate to the skill level and meaningful goals of the patient.
10. Modifications	No change of the planned intervention was made during the course of the study.
11. How well – planned	The occupational therapists registered patient attendance to sessions through a signature sheet. Weekly narrative notes (occupational therapist): ✓ Records of adverse side-effects. ✓ Modifications of the initial protocol.
12. How well – actual	A consecutive sample of 98 outpatients admitted to the OT wards participated. All participants completed the OT intervention and the initial and final assessments. No adverse side-effects were observed.

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