

Feasibility, safety and outcomes of playing Kinect Adventures! To people with Parkinson's disease: a pilot study

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Objectives

To assess the **feasibility**, **safety** and **outcomes** of playing **Microsoft Kinect Adventures**TM for people with **Parkinson's disease** in order to guide the design of a **randomised clinical trial**.

Design

Single-group, blinded trial.

Setting

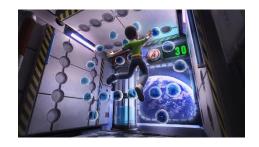
Rehabilitation Center of São Camilo University, Brazil.

Participants

- ✓ Seven patients (six males, one female)
- ✓ Parkinson's disease (Hoehn and Yahr Stages 2 and 3)

Interventions

- Fourteen 60-minute sessions
- Three times per week
- Four games of Kinect Adventures!™.



Space Pop



20,000 Leaks



Reflex Ridge



River Rush

Main outcome measures

Feasibility outcome:

patients' game performance

Safety outcome:

adverse events

Clinical outcomes:

- 6-minutewalk test
- Balance Evaluation System Test
- Dynamic Gait Index
- Parkinson's Disease Questionnaire (PDQ-39).

Results

Table 1 Patients' characteristics at baseline (n = 7).

Characteristics	Mean (SD)		
Age (years)	72 (9)		
Hohen and Yahr stage	2.1 (0.6)		
UPDRS	33.6 (9.8)		
Mini Mental Examination (score)	26.3 (3.1)		
Berg Balance Scale (score) 50.4 (3.1)			
Gender	6 males, 1 female		

Results

Table 2
Performance of patients on games.

Primary feasibility outcome: score	First training session, mean (SD)	Last training session, mean (SD)	Mean difference (SD) [95% Cl]	
Space Pop	151 (36)	198 (29)	-47 (7) [−79 to −15]	
20,000 Leaks	76 (29)	105 (12)	-30 (7) [-62 to 2]	
Reflex Ridge	182 (37)	224 (22)	-42 (9) [-80 to -4]	
River Rush	46 (18)	77 (22)	-32 (4) [-189 to -115]	

Results

Table 3 Performance of patients before and after training.

Scale	Before training mean (SD)	After training mean (SD)	Mean difference (SD) [95% CI]	ES	n
BESTest	74.1 (12.7)	88.9 (14.8)	14.1 (5.8) [-0.7 to 29.0]	1.1	10
DGI	19.8 (1.9)	22.3 (1.9)	2.4 (1.3) [0.4 to 4.5]	1.3	7
6MWT	399.3 (72.4)	429.5 (90.6)	30.1 (31.1) [-57.8 to 118.1]	0.3	48
PDQ-39	27.8 (8.3)	22.34 (7.7)	-5.5 (5.6) [-14.1 to 3.1]	0.7	15

BESTest, Balance Evaluation System Test; DGI, Dynamic Gait Index; 6MWT, 6-minute walk test; PDQ-39, Parkinson's Disease Questionnaire 39; UPDRS, Unified Parkinson's Disease Rating Scale; CI, confidence interval; SD, standard deviation; ES, effect size calculated for a paired *t*-test; *n*, sample size required to see a significant difference (assuming alpha of 0.05, power of 0.8 and 0.5 correlation between pre- and post-test values).

Conclusion

- ✓ Kinect-based training was safe and feasible (Stages 2 and 3 Parkinson's disease):
 - ✓ in a rehabilitation centre setting;
 - ✓ under the **supervision** of, and received **initial instruction** from, a **physical therapist**.
- ✓ Participants **improved their scores** on all the trained games
- ✓ No serious adverse events occurred during training.
- ✓ Improvements were noted across all domains of the ICF:
 - body functions (cardiopulmonary endurance)
 - activities (balance and gait)
 - participation (quality of life)
 - the results for the 6MWT and DGI were not clinically meaningful.