

Wiihabilitation in Geriatric day hospital:

**A Pilot study to assess its feasibility,
acceptability and efficacy**

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Background

- Geriatric Day Hospital (GDH)
 - provides multi-disciplinary rehabilitation for old patients (age >65) with different medical problems.
- Rehabilitation using interactive virtual reality Wii (Wiihabilitation)
 - Feasible and effective
 - Stroke
 - Subsyndromal depression
 - Reduce fall
- NO study looking at its use in Geriatric Day Hospital (GDH)

Methodology

- Clinical interventional trial with matched historic-controls
- Patients of a GDH were recruited to participate in Wiihabilitation by playing
 - “2P run” of “Wii Fit”

- Participants used Wii controller to perform movements involved in arm-ergometer (手動單車)
- Each participant received 8 sessions of Wiihabilitation on top of conventional GDH rehabilitations (during lunch time session)
 - Each session last around 10 minutes

- Inclusion criteria
 - Patients referred for rehabilitation in GDH of FYKH
 - had to be able to understand the procedure of using Wii
 - signed written informed consent prior to entry into the study

- Exclusion criteria
 - **In general: any unstable medical condition or patient refused**
 - poor vision
 - was unable to follow verbal commands
 - had global aphasia
 - had unstable angina or recent myocardial infarction, had heart failure (New York Heart Association Class III or IV)
 - had history of symptomatic ventricular tachyarrhythmias
 - had history of seizure
 - had severe chronic obstructive pulmonary disease
 - had uncontrolled hypertension
 - the patient was unwilling or unable to comply with the protocol.

- 25 secondary school student volunteers under close supervision by GDH doctor and staff helped to conduct the study.

Measurements and Outcomes

Feasibility

- Total time receiving Wii-IVR (event free)
- Objective measurement
 - Heart rate measurement before and during participating in Wii-IVR by pulse oximeter
 - Percentage maximal heart rate reserve (%MHR)
- Subjective measurement
 - Subjective fatigue assessment after participating in Wii-IVR
 - Borg Perceived Exertion Scale (BS) after participating in Wii-IVR
- %MHR and BS were compared with that after performing same duration of arm-ergometer

Acceptability

- Participants were assessed by an interviewer-administered questionnaire
- Volunteers were assessed by another questionnaire

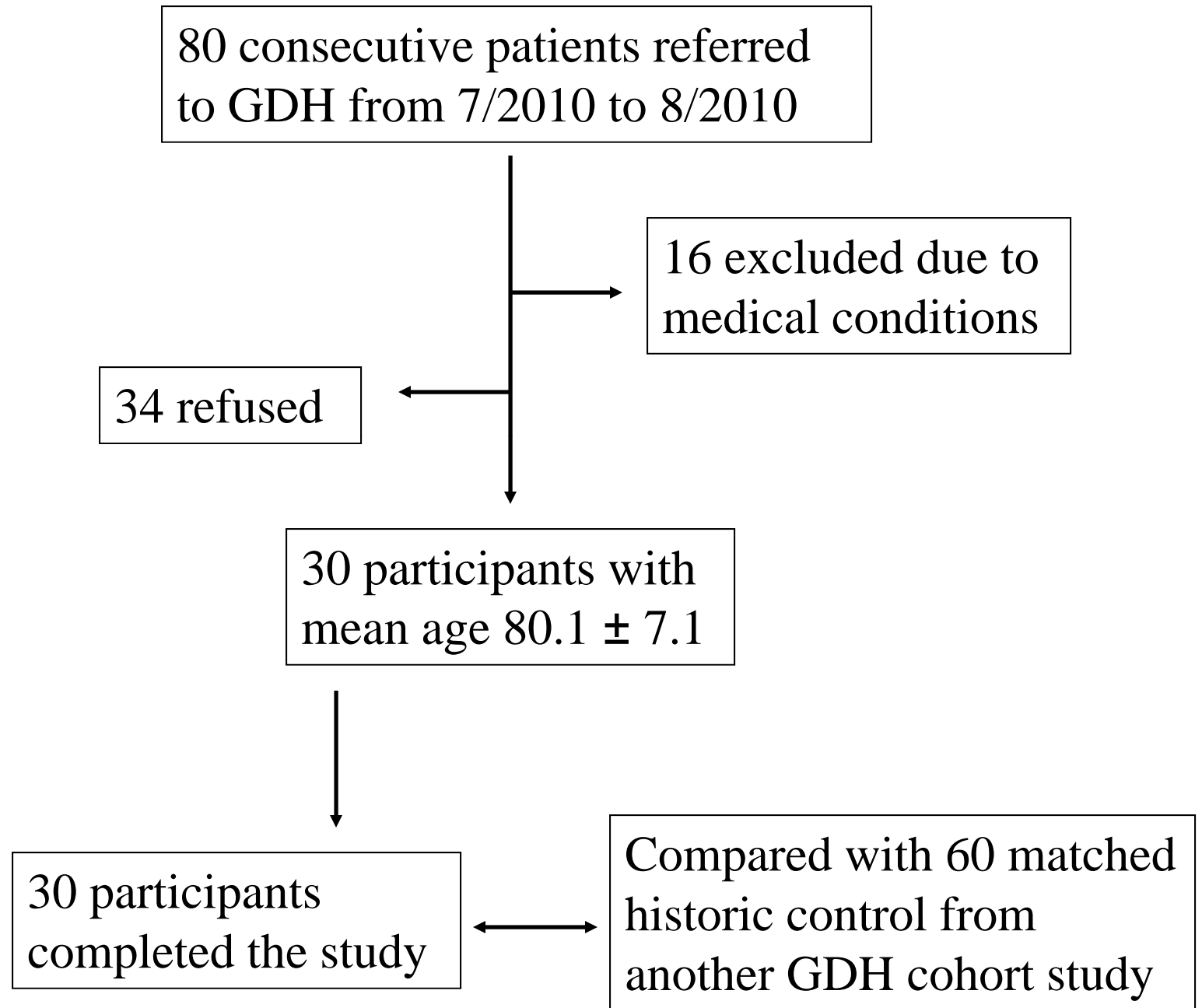
Efficacy

- assessed by comparing improvements in Functional Independence Measure (FIM)
 - between Wiihabilitation participants and matched historic-controls
 - who had received conventional GDH rehabilitations only

Ethics

- Formally approved by the institutional review boards at the HKU and HA HKWC
- We did NOT receive any sponsorship or assistance from Nintendo

Result



Feasibility

- Participants completed a total of 1941 minutes of event-free Wii-IVR

Table 3. Percentage maximal heart rate reserve and Borg perceived exertion scale for participant in Wii-IVR and its comparison with arm ergometer

	Wii-IVR	Arm ergometer	Difference (%)	p value ^b
Percentage maximal heart rate reserve (%) ^a	15.9 ± 9.9	17.3 ± 13.2	1.4 ± 7.7	0.36
Borg perceived exertion scale ^a	7.9 ± 2.3	7.3 ± 1.5	0.6 ± 1.5	0.11

Acceptability

- No participant had experience of participating in Wii-IVR before this study.
- 85 to 90%
 - felt happy after participating in Wii-IVR.
 - wished and would like to continue Wii-IVR at their home or nursing home if Wii-IVR was available.
 - agreed that older people could participate in Wii-IVR.

Efficacy

Table 2. Baseline characteristics of all participants and controls

	Participants (n=30)	Controls (n=60)	p value
Age (year) ^a	80.1 ± 7.1	80.0 ± 7.0	0.92
Gender ^b			0.15
Female	22 (73)	37 (62)	
Male	8 (27)	23 (38)	
Charlson Comorbidity Index	2.2 ± 1.3	2.1 ± 1.5	0.94
C-MMSE on admission ^b	21.7 ± 3.9	21.9 ± 5.0	0.83
Baseline FIM ^c	100.0 ± 8.9	99.0 ± 9.2	0.78
Referred diagnosis ^d			0.89
Fall	7 (23)	16 (27)	
Fracture neck of femur	6 (20)	12(20)	
Stroke	10 (33)	15 (25)	
Parkinson's disease	3 (10)	5 (8)	
Low back pain	4 (13)	12 (20)	

Table 4. Functional Independence Measure of participants and historic controls before and after rehabilitation programs

	Participants (n=30)	Historic Controls (n=60)	p value
Baseline FIM ^a	100.0 ± 8.9	99.0 ± 9.2	0.78
Final FIM ^b	108.7 ± 8.5	105.1 ± 9.1	0.091
FIM difference ^c	7.4 ± 2.5	5.9 ± 3.6	0.043 ^d

Attitude of volunteers

- 90 to 100% of volunteers
 - the first time to play Wii-IVR together with older adults
 - felt interesting or amazing when older adults participate in Wii-IVR
 - felt Wii-IVR may improve the relationship between them and older adults
 - would recommend Wii-IVR to their relatives
 - felt Wii-IVR under supervision was suitable for older adults

Conclusion

- Wiihabilitation under supervision in GDH is
 - Feasible
 - welcome by older people.
 - Improve motivation of performing rehabilitation exercise
- Wiihabilitation participants seemed to have more improvement in FIM scores.
- Wiihabilitation may promote inter-generation harmony

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 - to build up a “Wiihabilitation corner” in FYKH GDH

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