

本測驗共五大題，請依下列題目作答：

第一大題、請依據以下論文摘要，提出簡要中文結論 (conclusions) (20 分)

Abstract

Background: Mild cognitive impairment (MCI) is a transitional state between normal aging and dementia. Identifying this condition would allow early interventions that may reduce the rate of progression to Alzheimer's disease (AD). We examined the efficacy of a six-month cognitive intervention program (CIP) in patients with MCI and to assess patients' condition at one-year follow-up.

Methods: Forty-six MCI participants assessed with neuropsychological, neurological, neuropsychiatry, and functional procedures were included in this study and followed up during a year. The sample was randomized into two subgroups: 24 participants (the "trained group") underwent the CIP during six months while 22 (control group) received no treatment. Sixteen participants dropped out of the study. The intervention focused on teaching cognitive strategies, cognitive training, and use of external aids, in sessions of two hours, twice per week for six months. Cognitive and functional measures were used as primary outcome and all were followed up at one year.

Results: The intervention effect (mean change from baseline) was significant ($p < 0.05$) on the Mini-Mental State Examination (1.74), the Clinical Dementia Rating Scale (0.14), the Boston Naming Test (2.92), block design (-13.66), matrix reasoning (-3.07), and semantic fluency (-3.071) tasks. Four patients (one trained and three controls) progressed to dementia after one year of follow-up.

Conclusions: 請依據以上摘要內容，提出簡要中文結論。

見背面

第二大題、請以中文回答下列問題（每題 5 分，共 30 分）：

- (1) 此研究之動機為何？
- (2) 此研究之目的為何？
- (3) 此研究設計是否為隨機分配？
- (4) 研究結果說明在那些變項實驗組成效較佳？
- (5) 研究結果說明在那些變項控制組成效較佳？
- (6) 作者認為使用 Nintendo Wii™ 於治療應用的潛力為何？

Abstract

Objectives Physical and occupational therapists have started to use the Nintendo Wii™ gaming system with adults and children as part of their regular treatment. Despite the growing use of the Wii and trend towards evidence-based practice, limited evidence is available on the effectiveness of virtual reality using the Wii for children with developmental delay. The purpose of this study was to determine the feasibility and preliminary effectiveness of a low-cost gaming system for young children with developmental delay.

Participants and setting Forty children with developmental delay (age 39 to 58 months) who attended a segregated or integrated preschool participated in this study. All children's parents read and signed an informed consent form approved by the institutional review board. Children were assigned at random to an experimental (Wii) group ($n = 20$) or a control group ($n = 20$).

Intervention Two weekly sessions for 10 weeks using Nintendo Wii Sports™ and Nintendo Wii Fit™, including balance, strength training and aerobics games.

Main outcome measures Participants were evaluated 1 week before and 1 week after the programme by a blinded investigator. Primary outcomes were gait speed, timed up and go test, single leg stance test, five-times-sit-to-stand test, timed up and down stairs test, 2-minute walk test and grip strength. The Gross Motor Function Measure (GMFM) was used to assess gross motor skills.

Results The two groups were homogenous regarding all parameters at baseline. The Wii training was feasible and enjoyable for those in the experimental group. There were no adverse effects or injuries reported over 267 training sessions. Comparison of groups following the intervention indicated that the experimental group showed significant improvements compared with the control group in single leg stance test [mean difference 1.03 [standard deviation (SD) 1.7], 95% confidence interval (CI) 0.2 to 1.9; $P = 0.017$], right grip strength [mean difference 1.11 (SD 1.84), 95% CI 0.15 to 2.06; $P = 0.024$] and left grip strength [mean difference 0.90 (SD 1.67), 95% CI 0.03 to 1.77; $P = 0.043$]. Although changes in other outcome measures were not significant between the study groups, there were trends towards greater improvements in the experimental group compared with the control group.

Conclusion This study supports use of the Wii as a feasible, safe and potentially effective therapeutic tool to augment the rehabilitation of young children with developmental delay. The potential application of the Wii to increase the intensity of therapy or as a rehabilitation tool in children's homes and rural settings is an area worthy of investigation. The promising results of this study suggest that further studies are warranted to validate the potential benefits of a low-cost commercially available gaming system as a treatment strategy to supplement rehabilitation of children with disabilities.

第三大題、請以中文回答下列各題（每題 5 分，共 15 分）：

- (1) 本研究的目的為何？
- (2) 簡述本研究的主要結果。
- (3) 本研究論文對未來研究的建議為何？

Purpose: Upper limb post-stroke sensory impairments have an impact on a significant number of stroke survivors. There is limited research in this area and it is unclear how occupational therapists are addressing sensory impairments in clinical practice. This study aimed to investigate the clinical practice patterns of occupational therapists, perceived barriers to providing interventions and information sources used when addressing upper limb post-stroke sensory impairments.

Methods: A survey was sent to 500 randomly selected occupational therapists in the United States.

Findings: The majority of the 145 respondents reported frequently assessing sensation, and half reported providing interventions for sensory impairments. Interventions primarily focused on providing passive sensory stimulation followed by compensatory strategies. Most therapists provided patient/caregiver education about safety. Therapists cited lack of knowledge and skills, patients' short length of stay and lack of time as barriers to utilizing interventions. Most therapists reported not being up to date with current research and requested continuing education to support practice.

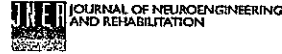
Conclusion: This survey established a profile of American occupational therapists' practice with people with upper limb post-stroke sensory impairments. Therapists have a need for information and training in all aspects of the management of upper limb post-stroke sensory impairment. Further research, evaluating the effectiveness of interventions and exploring therapists' clinical decision making when choosing interventions, is also needed.

見背面

第四大題、請閱讀並根據以下的論文摘要，簡要回答下列問題 (共 15 分)

- (1) 作者們認為需要設計可以透過腦機介面控制的輪椅的理由是什麼? (5 分)
- (2) 作者如何評估他們設計的腦機介面輪椅的表現? (5 分)
- (3) 使用者可以控制輪椅幾種動作? 透過何種方式控制? (5 分)

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RESEARCH

Open Access

Toward brain-computer interface based wheelchair control utilizing tactually-evoked event-related potentials

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Abstract

Background: People with severe disabilities, e.g. due to neurodegenerative disease, depend on technology that allows for accurate wheelchair control. For those who cannot operate a wheelchair with a joystick, brain-computer interfaces (BCI) may offer a valuable option. Technology depending on visual or auditory input may not be feasible as these modalities are dedicated to processing of environmental stimuli (e.g. recognition of obstacles, ambient noise). Herein we thus validated the feasibility of a BCI based on tactually-evoked event-related potentials (ERP) for wheelchair control. Furthermore, we investigated use of a dynamic stopping method to improve speed of the tactile BCI system.

Methods: Positions of four tactile stimulators represented navigation directions (left thigh: move left; right thigh: move right; abdomen: move forward; lower neck: move backward) and N = 15 participants delivered navigation commands by focusing their attention on the desired tactile stimulus in an oddball-paradigm.

Results: Participants navigated a virtual wheelchair through a building and eleven participants successfully completed the task of reaching 4 checkpoints in the building. The virtual wheelchair was equipped with simulated shared-control sensors (collision avoidance), yet these sensors were rarely needed.

Conclusion: We conclude that most participants achieved tactile ERP-BCI control sufficient to reliably operate a wheelchair and dynamic stopping was of high value for tactile ERP classification. Finally, this paper discusses feasibility of tactile ERPs for BCI based wheelchair control.

Keywords: Brain-computer interface, Event-related potentials, P300, Tactile, Wheelchair, Dynamic stopping

第五大題、請依據 Davis et al. (2009) 論文，回答以下問題（共 20 分）：

(1) 試翻譯本文第 193 頁方框內的前言(如箭頭指示) (10 分)

(2) 請依據美國心理學會 (American Psychological Association, APA) 著作格式，列出本文的文獻引用格式 (APA style) (10 分)

DEVELOPMENTAL MEDICINE & CHILD NEUROLOGY

ORIGINAL ARTICLE

Quality of life of adolescents with cerebral palsy: perspectives of adolescents and parents

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LIST OF ABBREVIATIONS

CPCHILD Caregiver Priorities and Child Health Index of Life with Disabilities
CP QOL-Child Cerebral Palsy Quality of Life Questionnaire for Children
QOL Quality of life
PedsQL Pediatric QOL Inventory

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Quality of life (QOL) has emerged over the past 20 years as an outcome for measuring the effectiveness of health-improvement interventions. The Cerebral Palsy Quality of Life Questionnaire for Children (CPQOL-Child) is well regarded and now integrated into research internationally. We describe the results of qualitative research, using grounded research in which we aimed to identify domains of QOL for adolescents with cerebral palsy (CP) from adolescent and parent perspectives to guide the development of an adolescent version. Seventeen adolescents (nine males, eight females) aged 13 to 18 years (mean=15.53, SD=1.74), with varying levels of impairment (Gross Motor Function Classification System levels I n=5, II n=2, III n=6, IV n=4, and V n=6) and their parents (n=23) participated in semi-structured interviews. Questions included: 'What do you think is important to your (child's) QOL?' and 'How does CP impact on your (child's) life?' Fifteen themes were identified, including domains related to health issues in adolescence, participation, education, specific CP-related issues (pain and discomfort, communication), family issues, practical issues (financial resources), and changes associated with adolescence (sexuality, independence). The composition of these QOL domains reflects the developmental concerns of adolescents with CP, adding to the views of children, and strongly supports adolescent participation in the development of self-reported well-being and QOL measures. Many of the domains are consistent with child reports of QOL and thus it appears feasible and valid to develop a measure that will be transferable across childhood and adolescence.

Cerebral palsy (CP) is the leading cause of physical disability in children and adolescents worldwide.¹ Measurement of quality of life (QOL), defined as an individual 'assessment of well-being across multiple domains of life',² is now considered to be an important outcome variable when evaluating intervention effectiveness for children and adolescents with CP. In order to do this, there has been an international call for a

condition-specific instrument that is more sensitive than a generic instrument.^{3,4} Until recently, no valid and reliable condition-specific measure of QOL for children with CP has been available, let alone a measure that accommodates the developmental transitions, experiences, and views of adolescents with CP.⁵ This has left the QOL of adolescents essentially unmeasured, a particular deficit for intervention studies.