

<Dorothy Li Bai, Chia-Kai Cheng, Yeh-Liang Hsu >. <Effect of an interactive intelligent carpet game on cognitive function and BPSD for dementia>. *Gerontechnology* 2020;19(Suppl.):<page>. The prevalence of dementia has been increasing in recent decades, which is a considerable challenge for the society. Non-pharmacological interventions including exercises, cognitive stimulations, music therapy, reminiscence, etc., are proved to improve the cognitive situations, behavioral and psychological symptoms of dementia (BPSD) and the quality of life for people with dementia¹. It is suggested that a combination of cognitive training and physical activity enhanced the effect of cognitive function improvement². Unfortunately, one of the biggest barriers is lack of motivation for people to engage in such activities. Serious game might be a solution which aims to design for a primary purpose such as education and training other than pure entertainment by combining technology, entertainment and engagement³. **Purpose** The main purpose of this study is to investigate the effect of an interactive intelligent carpet game designed based on the theory of serious game called *WhizToys* on cognitive function and BPSD among people with dementia. *WhizToys* included a series of games to train the function of matching, memory, and reaction by walking on the carpet. **Method** A convenient sample of thirty participants with mild to moderate dementia were recruited from Banqiao Veterans Home, Taiwan with 15 in the control group and 15 in the experimental group. After recruitment, participants played *WhizToys* twice a week with 20 minutes each time for three months. Pre-test and post-test data were collected for Mini-Mental State Examination (MMSE) for cognitive function and neuropsychiatric inventory (NPI) for BPSD. Apart from descriptive and comparative statistical analysis for the pre-test and post-test data, paired t-testes and logistic regression would be employed to compare the cognitive and BPSD symptoms between the control and experimental group. **Results & Discussion** Overall, 30 participants were recruited and completed the study with the average age of 85 years old. The intervention group had a reduction than that in the control group in the overall NPI score (-2.16, $P=0.040$) including the subcategories of delusion (-0.86, $P=0.035$), agitation (-0.92, $P=0.021$), and caregiver burden (-2.41, $P=0.018$), suggesting a significant reduction in BPSD as well as caregiver burden. For MMSE score, there was a minor reduction (-0.1, $P=0.758$) but without statistical significance. The interactive intelligent carpet game combining cognitive and physical training has a positive effect on reducing BPSD for people with dementia. In addition, it significantly lowers the burden for caregivers.

References

1. Douglas, S., James, I., & Ballard, C. (2004). Non-pharmacological interventions in dementia. *Advances in psychiatric treatment*, 10(3), 171-177.
2. Gheysen, F., Poppe, L., DeSmet, A., Swinnen, S., Cardon, G., De Bourdeaudhuij, I., ... & Fias, W. (2018). Physical activity to improve cognition in older adults: can physical activity programs enriched with cognitive challenges enhance the effects? A systematic review and meta-analysis. *International Journal of Behavioral Nutrition and Physical Activity*, 15(1), 63.
3. Michael, D. R., & Chen, S. L. (2005). *Serious games: Games that educate, train, and inform*. Muska & Lipman/Premier-Trade.

Keywords: gerontechnology, dementia, BPSD, cognitive function

Address: Rm3528, 135, Yuan-Tung Rd., Chung-Li, Tao-Yuan, Taiwan ; E: baili1204@gmail.com

