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Cognitive Training Program for Thai Older People with Mild Cognitive Impairment

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Abstract

Population of Thailand is growing rapidly to ageing society. Cognitive abilities change throughout life and decline in ageing depends on the particular type of memory. Cognitive slowing is the change of old age, which affects the individual's capacity to perform activity and quality of life. Mild cognitive impairment (MCI) is a deficit in cognitive function in memory, but does not effect to the daily functioning. However MCI is related in developing to Alzheimer's disease (AD) or other types of dementia commonly found in old age. This research focuses on the elderly people in Thailand with mild cognitive impairment for improving their cognitive function by forming web applications for computers, laptops or tablets. The purpose of this study is to develop a new computer-based program, containing cognitive training software for Thai elderly with mild cognitive impairment. The cognitive training program contains of six categories, involving visuospatial skill, working memory, abstraction, sequencing, categorization and orientation. The validity, reliability, and efficacy of the intervention of the cognitive training program will also investigate. The outcome of using this program will be used for future development of an effective intervention technique for Thai elderly with MCI.

Keywords: cognitive rehabilitation, cognitive training, mild cognitive impairment

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1. Introduction

Currently, Thai society is aging, and as a result, more people are presenting with mild cognitive impairment (MCI). MCI is a type of cognitive dysfunction linked to developing Alzheimer's disease (AD), and elderly people with this condition develop pathological dementia at a higher rate than normal persons [1]. MCI is characterized by the elderly having memory problems, but they are otherwise normal in their daily living activities and general cognitive functions, and do not suffer from dementia [2]. Although the capacity to perform activity of people with MCI remains normal, these individuals have reduced functional abilities relating to their cognitive decline in some tasks [3]. There are several types of treatment for people with MCI, including pharmacological approaches, group psychotherapy, family psychotherapy and cognitive training [4]. Cognitive training is a non-pharmacological approach and attractive intervention technique used for treating elderly people with MCI, and it improves the cognitive functions of individuals with cognitive impairment. This technique is based on the theory of neuroplasticity, which states that plasticity processes could strengthen the brain and neural network, resulting in brain function restoring sensory, cognitive, memory, motor and affected systems in aging people [5]. Today's technology applies several intervention techniques, including cognitive training. Recently, some studies developed cognitive training programs in the form of software applications that can be used on computers [6].

2. Research concept

The concept of this research is to develop a new computer-based program, containing cognitive training software for Thai elderly with mild cognitive impairment, for improving their cognitive function by forming web applications for computers, laptops or tablets.

3. Literature review

From the literature review, cognitive training is an effective cognitive intervention approach for elderly people with MCI [7, 8]. Furthermore, a program that contains a multi-domain of cognitive enhancement is more effective than those containing specific cognitive aspects, as seen by improvements of global cognitive function and transfer of skills [6]. In 2003, Gunther et al [9] studied the results of a computer-assisted cognitive training program for elderly people and found significant improvements in primary working memory. In addition, verbal and visual ability and, long-term memory, information processing speed, learning, and interference tendency improved significantly. Cipraini and colleagues [10] studied the result of a computer-based cognitive rehabilitation program, which compared patients with AD to those having MCI, and found that it significantly improved global cognitive status and/or specific cognitive areas in MCI and AD patients. Several other studies applied this technology for use as intervention for cognitive training in elderly people with MCI, and found that it improved global cognitive function and/or specific cognitive areas, especially memory in the intervention group [11, 12]. Additionally, some studies found that the computer-training program could lessen affect problems of patients, such as depression, and also improve their cognitive function [13, 14].

4. Research method

The literature was reviewed for different aspects of cognitive function, and brainstorming in selecting some important domains that can develop exercises or games for improving cognitive functions, which are ;visuospatial skill, working memory, abstraction, sequencing, categorization and orientation. Then, this study drafted a format on a storyboard for each exercise of a new computer-based program, which consists of six groups of exercises in six cognitive domains mentioned above with each group having different tasks and levels of difficulty. The content of each exercise is based on the concept of each aspect of cognitive function.

After the draft completed, five specialists were asked to consult on its content validity before creating a computer program. After creating the program, a reliability trial was performed and program specification verified for Thai elderly with MCI. Now, the program takes the form of a web application in order to study the efficacy of the cognitive training program.