

Official Title: Develop the Mini-flipped Game-based Learning Strategies in Modified Mediterranean Diet Interventions for Eating Behavior and Cognitive Performance Among Older Adults in the Community

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Study Protocol

Background

The world is facing an aging population and the number of people with mild cognitive impairment and dementia is increasing, causing a huge burden of medical costs for individuals, families and society. Previous studies have shown that the Mediterranean Diet (MD) can prevent cognitive decline, but older adults are less likely to follow the Mediterranean Diet and have little knowledge about the risk of dementia and protective factors of the diet. The Game-based learning can enhance the learning effectiveness and motivation of the elderly. In this study, the content of the Asian version of the Mediterranean Diet Pyramid and the local food materials from Taiwan will be integrated into the nutritional health education with game strategies of the Modified Mediterranean diet.

Objective

The purpose of this study was to explore the effect of developing Mini-flipped Game-based learning Strategies in Modified Mediterranean diet learning intervention to promote eating behavior and cognitive function of elderly people in community.

Methods

1. Study design:

This study was designed as a cluster randomized controlled trial. First, six communities were selected from Taipei Beitou District, and then randomly assigned to the experimental group and the control group by computer. A total of 80 elderly people were included in this study. The inclusion conditions of the research subjects include: (1) the elderly over 65 years old; (2) Those who have no visual or hearing impairment or mental impairment and can communicate in Chinese and Taiwanese; (3) Those who are willing to participate in the research and fill in the voluntary consent form. Exclusion criteria were :(1) diagnosed with cognitive dysfunction, brain injury and loss

of consciousness for more than 30 minutes or other central nervous system diseases; (2) Suffering from serious diseases, such as organ failure of heart, liver and lung, end-stage kidney disease, general paralysis, end-stage cancer or chemotherapy, and diagnosis of mental diseases.

2. Research tools:

The measurements included a demographic information, the Mediterranean Diet score, the Chinese version of the Montreal Cognitive Assessment Scale, the Chinese version of the Cognitive Failures Questionnaire, the Nutrition Knowledge for the Elderly Scale, the Chinese version Pittsburgh Sleep Quality Index, and the Center for Epidemiological Studies Depression Scale. The study was a single-blind design and was measured at the pre-test (week 0) and post-test (week 8).

3. Intervention approaches:

The experimental group used a Mini-flipped game-based learning strategies in modified Mediterranean diet learning intervention, and the duration of the intervention was 8 weeks, with 40-minute Mini-flipped game-based learning strategies in modified Mediterranean diet learning each week, which the content included: the relationship between the Mediterranean diet and dementia, knowledge of the Mediterranean diet, and how to incorporate local ingredients into the Mediterranean diet. The control group was given a leaflet on balanced diet and nutrition in elderly by the Health Promotion Administration.

Statistical Analysis Plan

SPSS25 software was used for data analysis. The scores of socio demography, eating behavior, cognitive function, nutritional knowledge, depression and sleep in the two groups were described by the descriptive statistical methods, such as percentage, mean and standard difference. Chi-square test (χ^2 test), Fisher's exact test or independent t-test were used to test the homogeneity of the two groups of data. In this study, generalized estimating equations (GEE) were used to measure the differences in dietary behavior, cognitive function and nutritional knowledge between the two groups before and after intervention. Two-tail test was used for all statistical analyses, and the significance level $\alpha=0.05$ was set.