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Fermented Garlic and Lettuce Improve Cognition in MCI : A Randomized Controlled Trial

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Introduction

Global population aging has increased the prevalence of cognitive decline, with mild cognitive impairment (MCI) affecting a growing number of adults worldwide. Because 10–12% of MCI cases progress to dementia within one year, early intervention is important. Fermented garlic and lettuce powders have shown potential neuroprotective and nutritional benefits in previous studies. This study evaluated the efficacy and safety of a combined fermented garlic and lettuce powder formulation on cognitive and psychological functions in adults with mild cognitive decline.

Methods

This was an investigator-initiated, parallel-design, randomized, assessor-blinded, placebo-controlled, single-center trial. The study protocol is summarized (Fig. 1). Adults aged ≥19 years with Korean version of Montreal cognitive assessment (K-MoCA) scores of 16-23 were enrolled. Participants were randomly assigned to receive either fermented garlic and lettuce powder or placebo daily for 2 months. The primary outcome was the change in K-MoCA scores. Secondary outcomes included Seoul verbal learning test (SVLT), Korean color word stroop test (KCWST), Beck depression inventory (BDI), EuroQol 5 dimension questionnaire (EQ-5D), multidimensional fatigue scale (MFS), psychosocial well being index-short form (PWI-SF), and Leeds sleep evaluation questionnaire (LSEQ).

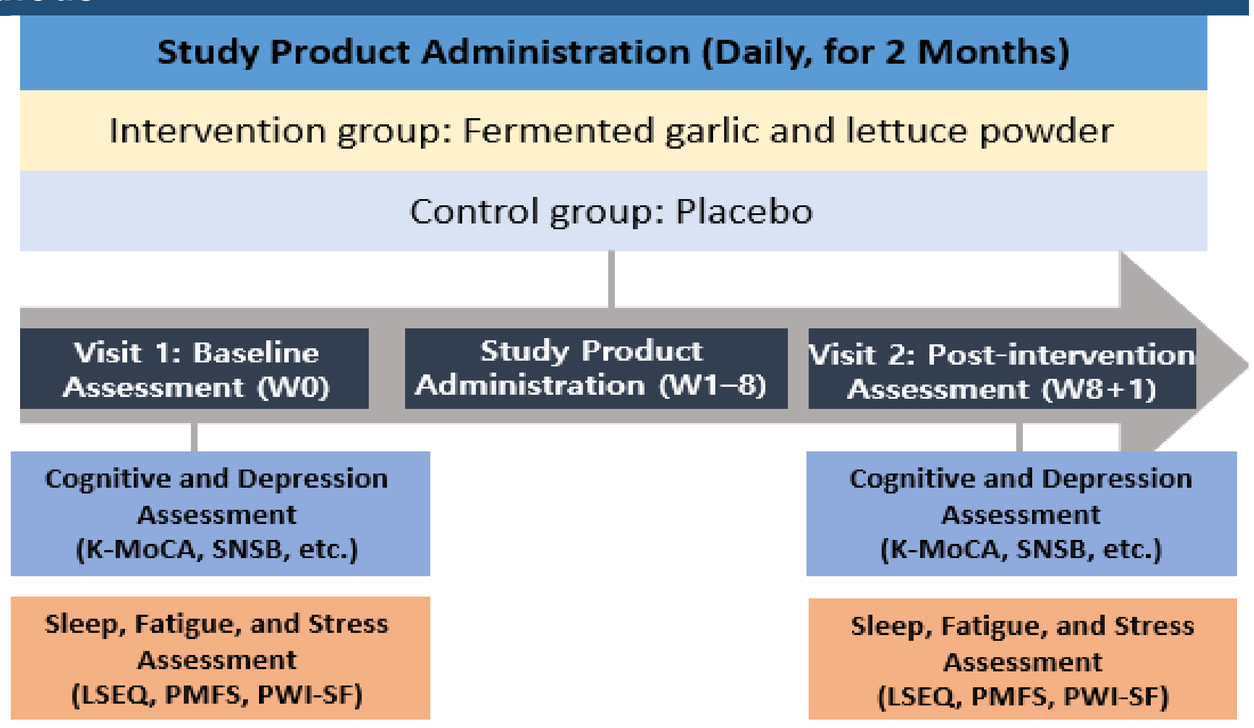

Figure 1. Study design and protocol

Results

58 of 75 enrolled subjects completed the study (29 per group). The analysis of participants' demographic characteristics showed no statistically significant difference in sex distribution between the experimental and control groups. Both groups consisted of 7 males and 22 females (n=29 each). Cognitive assessments revealed significant within group improvements in both groups for K-MoCA, SVLT recognition, and KCWST scores (Fig. 2). Between group analysis showed a trend toward greater K-MoCA improvement in the intervention group (p=0.063). Psychological assessments demonstrated more robust treatment effects: the intervention group showed significantly lower stress levels (PWI-SF, p=0.025) compared to controls, and unlike the control group which showed significant depression score worsening (BDI, p=0.023), the intervention group maintained baseline depression levels (Fig. 3). No significant differences were observed in quality of life, fatigue, or sleep quality measures (Fig. 4). Safety analysis revealed no adverse events in either group.

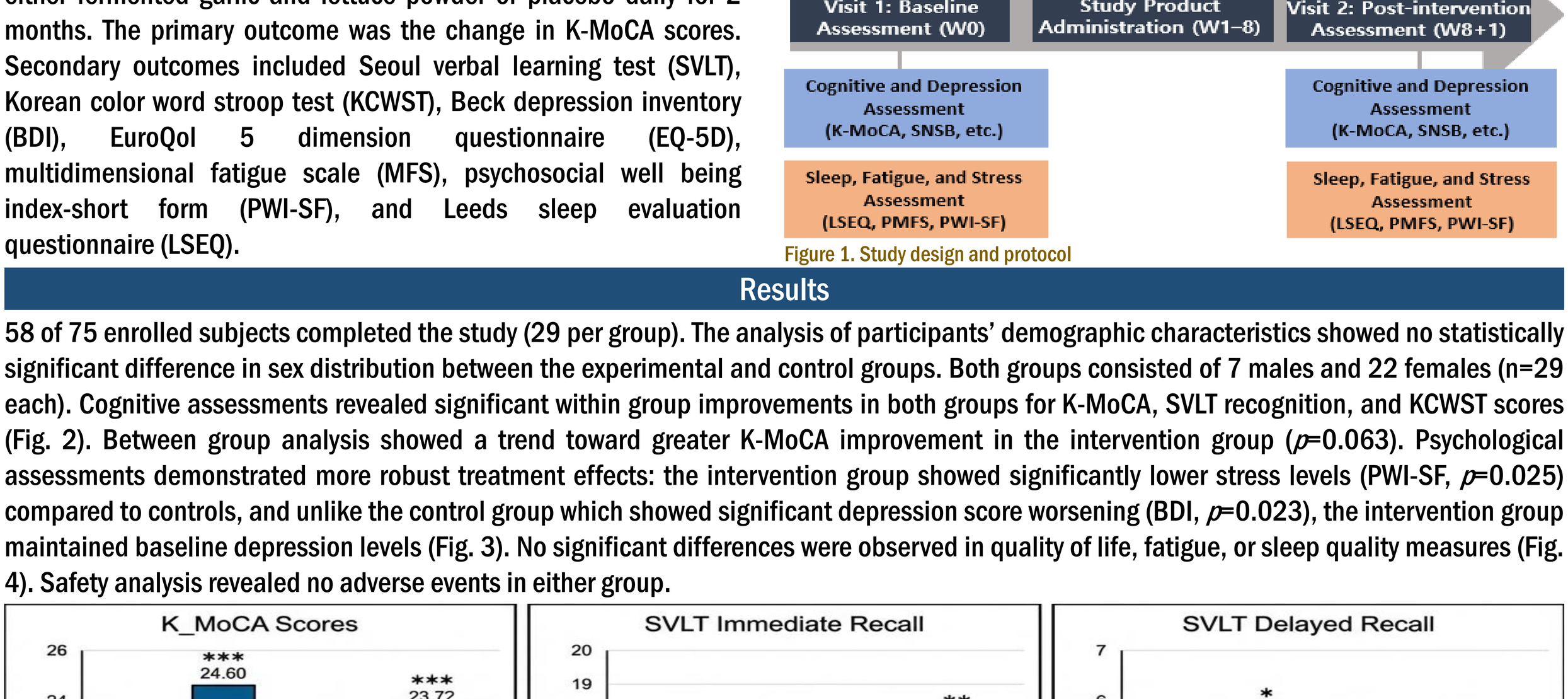

Figure 2. Effects of fermented garlic and lettuce powder on cognitive function measures

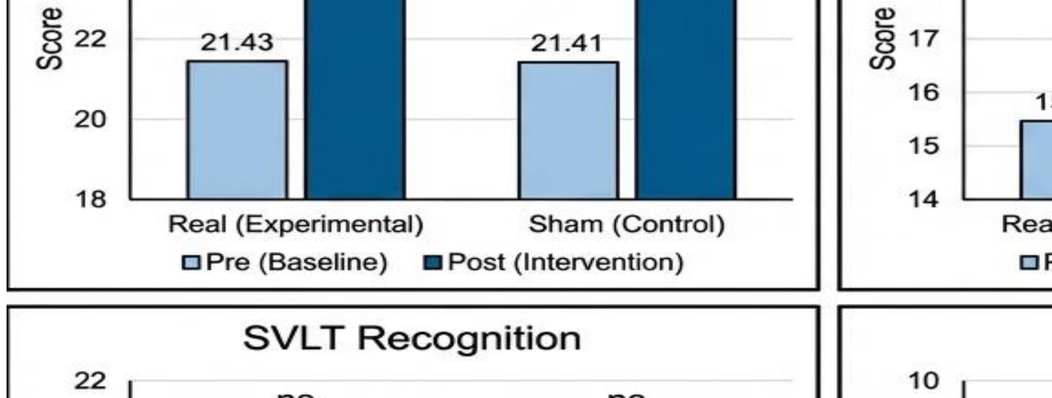

Figure 3. Effects on psychological well-being: stress (PWI-SF) and depression (BDI)

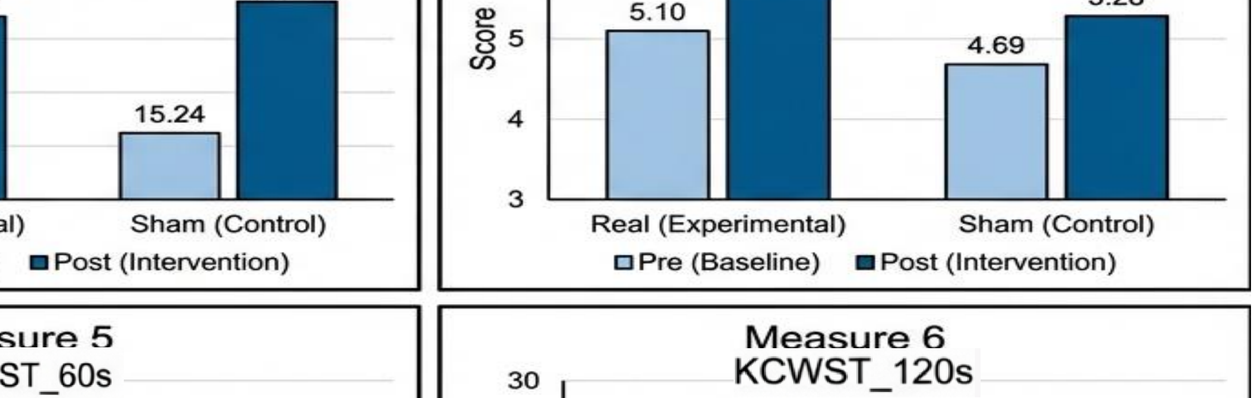

Figure 4. Secondary outcomes: quality of Life (EQ-5D), fatigue (MFS), and sleep quality (LSEQ)

Conclusion

While fermented garlic and lettuce powder did not demonstrate clear superiority in overall cognitive function compared to placebo, it showed positive trends in general cognitive levels and subjective well being, with significant protective effects against stress and emotional deterioration. The intervention was safe and well tolerated, suggesting potential as a complementary approach for managing mild cognitive decline in the context of preventive rehabilitation strategies.

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