**Supplementary Table 1. Covariate variables used in each analysis**

|  |  |  |
| --- | --- | --- |
| Purpose of analysis  | Analysis method | Covariate variables  |
| Comparison of age, SGDS-K, PROVE-DS and PROVE-SR scores by group | Two tailed t-test | None |
| Comparison of the ratio of sex, education status, marital status, occupational status, depressive disorder history, BS4MI group, medication history, computer and smartphone use experience by group | Chi-square analysis | None |
| Comparison of VR test score, MOCA score, DHEAsum and VRSQ score by group | ANCOVA | Age, current psychiatric and cognitive medication |
| Investigate validity of VR and MOCA test to discriminate normal and MCI group | ROC curve analysis | None |
| Correlations between MOCA and VR scores | Partial correlation analysis | Age, current psychiatric and cognitive medication |
| Correlations between VR score and DHEAsum  | Partial correlation analysis  | Age, current psychiatric and cognitive medication |

SGDS-K, short form of the Korean Geriatric Depression Scale; PROVE, Protective and Vulnerable factors battery questionnaire; DS, depressive symptomatology; SR, suicide risk;BS4MI-elderly, brief screening for four mental illnesses in the elderly; VR, virtual reality; MOCA, Montreal Cognitive Assessment; DHEA, dehydroepiandrosterone; VRSQ, Virtual Reality Sickness Questionnaire; MCI, mild cognitive impairment.

**Supplementary Table 2. Correlation coefficients between VR cognitive test and MOCA test by group**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Whole participants(n = 120) | Normal(n = 108) | MCI (n = 12) |
| VR total score & MOCA total score | 0.644\*\*\* | 0.621\*\*\* | 0.763\* |
| VR memory score & MOCA delayed recall score | 0.41\*\*\* | 0.406\*\*\* | 0.505 |
| VR attention score & MOCA attention score | 0.326\*\*\* | 0.295\*\* | 0.428 |
| VR visuospatial function score & MOCA executive-visuospatial function score | 0.4\*\*\* | 0.393\*\*\* | 0.47 |
| VR Executive function score & MOCA executive-visuospatial function score | 0.349\*\*\* | 0.329\*\* | 0.524 |

VR, virtual reality; MOCA, Montreal Cognitive Assessment; MCI, mild cognitive impairment. \*, p < 0.05; \*\*, p < 0.01; \*\*\*, p < 0.001.