**Supplementary Information**

Nutritional Status and Physical Activity are Associated with Cognitive Function in Chinese Community-Dwelling Older Adults: the Role of Happiness

Jianghong Liu 1, \*, Dingyudu Pan 1, 2, Mckenna Angela Sun 1, 3, Haoer Shi 1 and Rui Feng 4

1 School of Nursing, University of Pennsylvania, Philadelphia, PA 19104, USA; jhliu@nursing.upenn.edu (J.L.); haoershi@nursing.upenn.edu (H.S.)

2 School of Engineering and Applied Science, University of Pennsylvania, Philadelphia, PA 19104, USA; pdyd@seas.upenn.edu

3 College of Arts & Sciences, University of Pennsylvania, Philadelphia, PA 19104, USA; masun@sas.upenn.edu

4 Department of Biostatistics, Epidemiology, and Informatics, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA 19104, USA; ruifeng@pennmedicine.upenn.edu

**\*** Correspondence: jhliu@nursing.upenn.com; Tel.: +1-(215)-898-8293

**Table S1.** Bivariate Pearson’s correlation between variables.

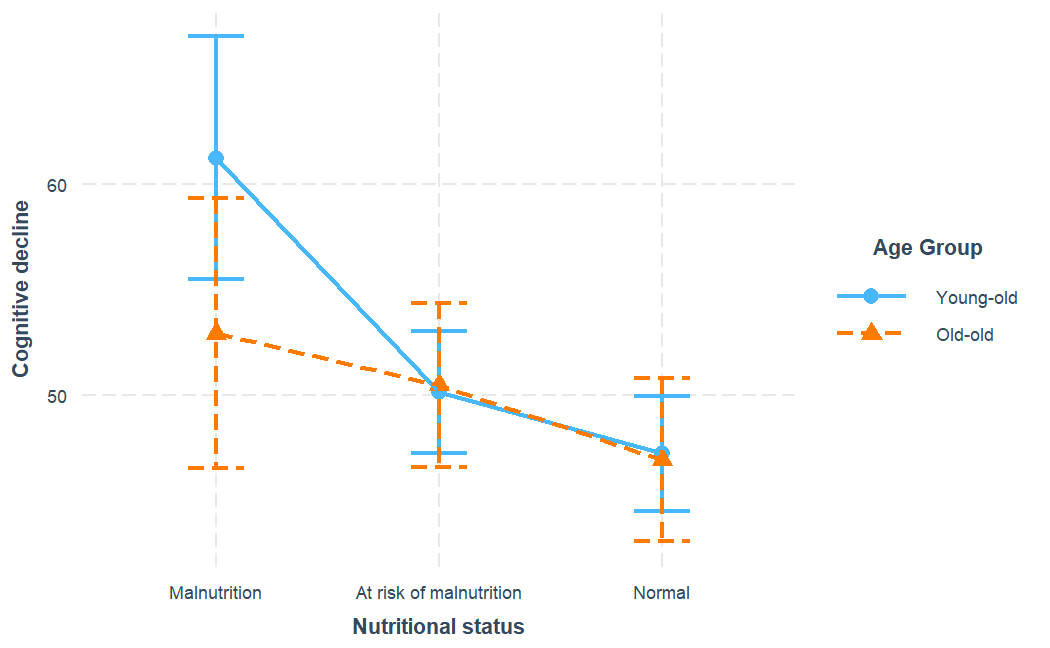
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Predictors** | **Nutrition** | **Exercise** | **Happiness** | **Cognitive decline** |
| Nutrition |  |  |  |  |
| Exercise | 0.15\*\*\* |  |  |  |
| Happiness | 0.21\*\*\* | 0.15\*\*\* |  |  |
| Cognitive decline | -0.25\*\*\* | -0.13\*\*\* | -0.17\*\*\* |  |
| Age | -0.13\*\*\* | -0.08\* | -0.01 | 0.10 |

Note: Nutrition, MNA nutritional status; Exercise, physical activity, 1 = not doing exercise, 2 = doing exercise. \*: p-value < 0.05, \*\*: p-value < 0.01, \*\*\*: p-value < 0.001. † Indicated marginal significance.

**Table S2.** Adjusted association of cognitive decline with nutritional status, stratified by age.

|  |  |  |
| --- | --- | --- |
|  | **Young-old**  **(N = 524)** | **Old-old**  **(N = 173)** |
| **Predictors** | **β (SE)** | **β (SE)** |
| Nutrition (Normal as reference) | | |
| At-risk | 2.96 (0.95)\*\* | 2.90 (1.53)† |
| Malnutrition | 11.10 (2.30)\*\*\* | 9.05 (5.61) |
| Exercise (No as reference) | | |
| Yes | -2.35 (0.96)\* | -1.16 (1.64) |

Note: All models adjusted for age, gender, income, education, marital status. β, estimated regression coefficient; SE, standard error; \*: p-value < 0.05, \*\*: p-value < 0.01, \*\*\*: p-value < 0.001. † Indicated marginal significance.



**Figure S1.** Stratified associations of cognitive decline with nutritional status across young-old (age < 74) and old-old (age >= 74) age sub-groups. Models adjusted for age, gender, income, education, marital status.