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Tea consumption and mental health in ageing: Findings from ethnic Chinese populations

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The association between tea and better physical health is supported by accumulating evidence from decades of research that have examined the role of tea in reducing the risk of various medical conditions. Although it is generally believed that tea ingestion improves psychological performance and mental well-being, the mental health benefits of long-term tea drinking were only examined by a handful of research studies in recent years. Using large data from community-based cohort studies in ethnic Chinese populations in Singapore and China, my coworkers and I have systematically examined the role of tea drinking on mental health in aging in recent years.[1–6] We are particularly interested incognition and depression in the elderly.

To examine the cross-sectional relationship between tea drinking and cognitive functioning, we analysed neuropsychological data of 716 non-demented Chinese older adults from the Singapore Longitudinal Ageing Study (SLAS).[1] The SLAS neuropsychological test battery assessed a wide range of cognitive domains. For better interpretation, we transformed all raw test scores to standardized *Z* scores and then created four composite domain scores with those Z scores. In multiple linear regressions, after adjusting for potential confounders, total tea consumption was independently associated with better performances on global cognition, executive function, and information processing speed. Both black/oolong tea and green tea consumption were associated with better cognitive performance.[1] The study provided evidence that the protective effect of tea consumption on cognitive function was not limited to a particular type of tea.

To establish longitudinal association between tea consumption and future cognitive decline, we analyzed data from 1438 SLAS participants who had complete Mini-Mental State Examination (MMSE) data at baseline and a median of 16 months after baseline.[2] Cognitive decline was defined as a MMSE total score drop of 1 point or greater during the follow-up period. Compared with subjects with rare or no tea intake, the odds of having cognitive decline for subjects with low, medium, and high levels of tea intake were 0.74, 0.78 and 0.57, respectively (P for linear trend = 0.042).[2]

We replicated the above findings on cognitive benefit of tea drinking using large population-based data from oldest-old (80–115 years old) subjects in the Chinese Longitudinal Healthy Longevity Survey (CLHLS) cohort.[3] In this project, cognitive function was assessed by repeated measures (four times) of the verbal fluency test. In the linear mixed effects model that adjusted for age, gender, years of schooling, physical exercise and activities score, the regression coefficient for daily drinking and occasional drinking was 0.72 ($I < 0.0001$) and 0.41 ($P = 0.01$) respectively.[3] Tea drinkers had higher verbal fluency scores throughout the follow-up period. This work support that the cognitive benefits of tea drinking is evident even in very late stage of life.

Two studies were conducted to test the hypothesis that tea consumption is associated with less depressive symptoms in late life. The first study was based on longitudinal data of 1615 subjects from the SLAS cohort,[4] tea consumption information was collected at baseline and depressive symptoms were assessed at follow-up visit using the 15-item Geriatric Depression Scale (GDS). In descriptive and multiple logistic regression analysis, we found that higher levels of tea consumption were associated with lower risk of having depressive symptoms at follow-up visit. The proportion of participants with depression at follow-up decreased with increasing tea consumption (6.6%, 5.3%, 3.2% and 1.8% for none, low, medium and high tea intake respectively). The odds ratio of depressive symptoms at follow-up for participants with medium and high tea consumption was 0.55 and 0.37, respectively, after adjustment of potential confounding factors.[4] The results remained unchanged when

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all participant with cognitive impairment at baseline were excluded from analysis. This is the first study that examined the longitudinal association between tea consumption and clinically meaningful depressive symptoms in older adults with community-based data. The results are encouraging and support that tea could be potential preventive for depression.

Recently, we replicated the research findings on tea and late life depression with community based data from the Confucius Hometown Aging Project (CHAP).[5] In this study, information on tea consumption information and depressive symptoms was collected through face-to-face interview. The presence of high depressive symptoms was defined on the 15-item Geriatric Depression Scale as a score ≥5. Among the 1368 CHAP participants that were included in the analysis, 165 (12.1%) were weekly and 489 (35.7%) were daily tea consumers. Compared with non/irregular tea consumption,the odds ratios of having elevated depressive symptoms were 0.86 for weekly and 0.59 for daily tea consumption (P for linear trend = 0.001); the linear trend of the association remained statistically significant when further controlling for history of stroke, transient ischemic attacks, and presence of carotid plaques.[5] Data from this study further supported our hypothesis that tea consumption is associated with a lower risk of depression in late life. It also demonstrated that the association between tea drinking and reduced depression risk is not likely to be mediated by cerebrovascular disease and atherosclerosis.

In summary, our findings from ethnic Chinese populations suggest that tea consumption is associated with better mental health in ageing.[1–6] However, firm conclusion must be supported by more longitudinal studies and clinical trials. Since previous studies were all limited in using self-reported questionnaire data to assess tea intake, I propose that objective biomarkers of tea intake should be be used in future studies. Clinical trials on tea extracts or bioactive compounds in tea must be conducted as only interventional studies will be able to provide the definite answer on whether tea or tea compounds really can promote mental health outcomes in ageing.[6]

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