PRESS RELEASE

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Boosting fruit intake during midlife can ward off late-life blues: NUS study

In a large Singapore cohort study involving over 13,000 participants spanning close to 20 years, higher consumption of fruits during midlife was found to be associated with lower odds of depressive symptoms at late-life

Singapore, 22 July 2024—Populations are rapidly ageing worldwide, and there is an increased prevalence of late-life depressive symptoms among older adults, which include depressed feelings, lack of pleasure, delayed cognitive processing and reduced volitional activity, often accompanied by loss of appetite, insomnia, poor concentration, and increased fatigue. This has been related to underlying neurodegenerative changes in the brain associated with ageing. The growing imperative to keep older adults in good health has spurred extensive research into approaches that could prevent late-life depression, and accumulating evidence has revealed the plausible role of dietary factors in protecting against depression in ageing. Could specific diet or food items consumed earlier in life have an impact on mental well-being in later years?

In a longitudinal study conducted by the **Yong Loo Lin School of Medicine, National University of Singapore (NUS Medicine)**, involving 13,738 participants from the large population-based Singapore Chinese Health Study that tracked participants through their mid-life to later life spanning about 20 years, researchers found that participants who consumed higher quantities of fruits earlier in life exhibited a reduced likelihood of experiencing depressive symptoms later in life.

The authors studied a total of 14 fruits most commonly consumed in Singapore and found that the consumption of most fruits, including oranges, tangerines, bananas, papayas, watermelons, apple and honey melon, was associated with reduced likelihood of depression. The association could possibly be the high levels of antioxidants and anti-inflammatory micronutrients in fruits—such as vitamin C, carotenoids and flavonoids—which have been shown to reduce oxidative stress and inhibit inflammatory processes in the body that may affect the development of depression. Consumption of vegetables, on the other hand, was found to have no association with the likelihood of depressive symptoms. The findings, published in the *Journal of Nutrition, Health and Aging*, provide valuable insights into the potential benefits of eating sufficient fruits in mitigating depressive symptoms later in life.

Professor Koh Woon Puay from the Healthy Longevity Translational Research Programme at NUS Medicine and Principal Investigator of the study, said, "Our study underscores the importance of fruit consumption as a preventive measure against ageing-related depression. In our study population, participants who had at least 3 servings of fruits a day, compared to those with less than one serving a day, were able to reduce the likelihood of ageing-related depression significantly by at least 21%. This can be achieved by eating one to two servings of fruits after every meal. We did not see any difference in our results between fruits with high and low glycemic index. Hence, for those with diabetes, they can choose fruits with low glycemic index that will not raise blood sugars as much as those with high index."

At the initial stage of the study from 1993 to 1998, when participants were of average age of 51 years, they were asked to answer a structured questionnaire on how often they consumed a standard serving size of each food item daily, for 14 fruits and 25 vegetables. In 2014 to 2016, when participants were of average age of 73 years, depressive symptoms were examined using a standard test (Geriatric Depression Scale) and 3,180 (23.1%) participants who reported having five or more symptoms were considered to have depression in our study. After adjusting for factors that could potentially confound the relationship, including medical history, smoking status, level of physical activity, sleep duration, and ageing-related factors, the team found that higher consumption of fruits, but not vegetables, was associated with lower odds of depressive symptoms in a stepwise manner.

Prof Koh added, "Our study aimed to examine the relationship of mid-life consumption of fruits and vegetables with the risk of depressive symptoms in late life. Although other studies have also examined the associations of fruits and vegetables with risk of depression, there are inconsistencies in the results, and many of them were done in Western populations. To our best knowledge, ours is the largest population-based study in an Asian population to study this association."

These findings suggest that promoting fruit consumption for individuals in mid adulthood, typically defined as ages 40 to 65 years, could yield long-term benefits for their mental well-being at late adulthood beyond 65 years. Hence, the study's results hold significant implications for public health education and initiatives to make fruits more accessible for the general population. Following the study, the research team is looking into the association of other modifiable behavioural factors, such as sleep duration, smoking and other dietary factors, with the mental health of older adults.

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Our multidisciplinary and real-world approach to education, research and entrepreneurship enables us to work closely with industry, governments and academia to address crucial and complex issues relevant to Asia and the world. Researchers in our faculties, research centres of excellence, corporate labs and more than 30 university-level research institutes focus on themes that include energy; environmental and urban sustainability; treatment and prevention of diseases; active ageing; advanced materials; risk management and resilience of financial systems; Asian studies; and Smart Nation capabilities such as artificial intelligence, data science, operations research and cybersecurity.

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Through a dynamic and future-oriented five-year curriculum that is inter-disciplinary and inter-professional in nature, our students undergo a holistic learning experience that exposes them to multiple facets of healthcare and prepares them to become visionary leaders and compassionate doctors and nurses of tomorrow. Since the School's founding in 1905, more than 12,000 graduates have passed through our doors.

In our pursuit of health for all, our strategic research programmes focus on innovative, cutting-edge biomedical research with collaborators around the world to deliver high impact solutions to benefit human lives.

The School is the oldest institution of higher learning in the National University of Singapore and a founding institutional member of the National University Health System. It is one of the leading medical schools in Asia and ranks among the best in the world (Times Higher Education World University Rankings 2024 by subject and the Quacquarelli Symonds (QS) World University Rankings by subject 2023).

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