Does junk food shrink your brain?

September 11 2015

New research has shown for the first time that the part of the brain used for learning, memory and mental health is smaller in people with unhealthy diets.

The results of the study by researchers at Deakin University and the Australian National University (ANU) suggest that older Australians with unhealthy diets have smaller hippocampi - the hippocampus is a part of the brain believed to be integral to learning, memory and mental health. It has also shown that older people with healthier diets have larger hippocampi.

Associate Professor Felice Jacka, lead author of the study and researcher with Deakin University's IMPACT Strategic Research Centre in Geelong, said that as the negative impact of unhealthy foods on the waistline of the population grows, so does the evidence suggesting that our brain health is also affected.

"It is becoming even clearer that diet is critically important to mental as well as physical health throughout life," Associate Professor Jacka said.

"We've known for some time that components of diet, both healthy and unhealthy, have a rapid impact on aspects of the brain that affect hippocampal size and function, but up until now these studies have only been done in rats and mice. This is the first study to show that this also appears to be the case for humans."

The researchers used magnetic resonance imaging to measure the size of

hippocampi (there are two in the brain – left and right) in Australian adults aged 60-64 years and participating in the PATH study - a large longitudinal study of ageing conducted at the ANU. They also measured the participants' regular diets and took into account a range of other factors that could affect the hippocampus.

The results of the study, now published in the international journal *BMC Medicine*, suggest that older adults who eat more unhealthy foods, such as sweet drinks, salty snacks and processed meats, have smaller left hippocampi. It also shows that older adults who eat more nutrient-rich foods, such as vegetables, fruits and fish, have larger left hippocampi. These relationships existed over and above other factors that may explain these associations, such as gender, levels of physical activity, smoking, education or depression itself.

These findings have relevance for both dementia and mental health, Associate Professor Jacka said.

"Mental disorders account for the leading cause of disability worldwide, while rates of dementia are increasing as the population ages," she said.

"Recent research has established that diet and nutrition are related to the risk for depression, anxiety and dementia, however, until now it was not clear how diet might exert an influence on mental health and cognition.

"This latest study sheds light on at least one of the pathways by which eating an unhealthy diet may influence the risk for dementia, cognitive decline and mental disorders such as depression and anxiety in older people.

"However, it also points to the importance of diet for brain health in other age groups. As the hippocampus is critical to learning and memory throughout life, as well as being a key part of the brain involved in

mental health, this study underscores the importance of good nutrition for children, adolescents and adults of all ages."

More information: "Western diet is associated with a smaller hippocampus: a longitudinal investigation." *BMC Medicine* 2015, 13:215 DOI: 10.1186/s12916-015-0461-x

Provided by Deakin University