

Harmful body fat not only increases your waistline, but also your risk of dementia

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It's the global epidemic that affects two in every five adults, but as obesity continues to expand waistlines worldwide, researchers at the University of South Australia are warning that harmful body fat can also

increase the risk of dementia and stroke.

Examining gray brain matter of about 28,000 people, the world first research showed that increased body fat incrementally leads to increased atrophy of gray matter in the brain and consequently higher risk of declining brain health.

Gray matter is an essential part of the brain responsible for execution control, muscular and sensory activity as well as learning, attention, and memory.

Obesity is a major issue worldwide, with numbers nearly tripling since 1975. Data from the World Health Organization shows that more than 1.9 billion adults are overweight, with 650 million being obese. More than 340 million children (aged 5-19) are overweight or obese, with 39 million children under the age of five also falling into this category.

Lead researcher, UniSA's Dr. Anwar Mulugeta, says the findings add to the growing issues associated with being overweight or obese.

"Obesity is a genetically complex condition characterized by the excessive body fat," Dr. Mulugeta says.

"Commonly linked to cardiovascular disease, type 2 diabetes, and [chronic inflammation](#) (a marker of dementia), obesity currently costs Australia's economy about \$8.6 billion dollars each year.

"While the disease burden of obesity has increased over the past five decades, the complex nature of the disease means that not all [obese individuals](#) are metabolically unhealthy, which makes it difficult to pinpoint who is at risk of associated diseases, and who is not.

"Certainly, being overweight generally increases your risk for

[cardiovascular disease](#), type 2 diabetes, and low-grade inflammation, but understanding the level of risk is important to better direct supports.

"In this study, we investigated the causal relationships of individuals within three metabolically different obesity types – unfavorable, neutral and favorable—to establish whether specific weight groups were more at risk than others.

"Generally, the three obesity subtypes have a characteristic of higher body mass index, yet, each type varies in terms of body fat and visceral fat distribution, with a different risk of cardiometabolic diseases.

"We found that people with higher levels of obesity especially those with metabolically unfavorable and neutral adiposity subtypes had much lower levels of gray brain matter, indicating that these people may have compromised brain function which needed further investigation.

"However, we did not find conclusive evidence to link a specific obesity subtype with dementia or stroke. Instead, our study suggests the possible role of inflammation and metabolic abnormalities and how they can contribute to obesity and gray matter volume reduction."

The study used Mendelian randomisation to examine the [genetic data](#) of up to 336,000 individual records in the UK Biobank, with self-reported information and linked hospital and death register records to connect dementia and stroke.

It found that middle to elderly age groups (37-73) gray [brain](#) matter decreased by 0.3 percent for every extra 1 kg/m², which is equivalent of an extra 3 kg of weight for person of average height individuals, (173 cm)

Senior investigator, Professor Elina Hyppönen, Director of UniSA's

Australian Centre for Precision Health based at SAHMRI, says maintaining a healthy weight is important for general public health.

"It is increasingly appreciated that obesity is a complex condition, and that especially excess fat which is located around the internal organs have particularly harmful effects on health," Professor Hyppönen says.

"Here, we used the individuals' genetic and metabolic profiles to confirm different types of obesity. In practice, our findings very much support the need to look at the type of [obesity](#) when assessing the type of likely health impact.

"Even in a relatively normal weight individual, excess weight around the abdominal area may be a cause of concern."

More information: Anwar Mulugeta et al, Unlocking the causal link of metabolically different adiposity subtypes with brain volumes and the risks of dementia and stroke: A Mendelian randomization study, *Neurobiology of Aging* (2021). [DOI: 10.1016/j.neurobiolaging.2021.02.010](#)

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