New study finds link between smell and obesity

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Dr Mei Peng. Credit: University of Otago

University of Otago researchers have broken new ground by identifying a link between smell and obesity. The findings will be published today in the international *Obesity Reviews* journal.

Lead-author of the study, Dr. Mei Peng, from the University of Otago's Department of Food Science, says the link between smell and people's body-shape was previously a relatively unknown area of scientific study and knowledge.

"After compiling our evidence we found there is, in fact, a strong link between a person's body weight and their smell ability – the better a person can smell, the more likely the person is to be slim, or vice versa," Dr. Peng says.

Of the five senses, Dr. Peng considers smell to be the least understood, but at the same time says it is perhaps the most important sense for influencing eating behaviour through detecting and discriminating between different flavours.

"We found obese people's ability to detect and discriminate smell was not as efficient as slim people. This can result in obese people having a higher chance of making poor food choices because they will need other forms of stimulation to enjoy food. For example they might choose, or be more attracted to, saltier and tastier foods such as bacon and maple syrup instead of blander foods such as low-fat cereal with less sugar," Dr. Peng says.

Of note is that body weight has to pass a certain benchmark for the link to become obvious – so the reduction in ability to detect and discriminate between different smells was greater among people who were closer to being obese. The researchers hypothesise that once a person is obese their metabolism alters several peptides and hormones which have an impact on the gut-brain signalling pathway.

This leads to another area of consideration about two surgical obesity treatments; stomach removal, and gastric bypass. The research found stomach removal can actually improve smell ability, whereas other obesity surgeries do not have the same effect on people's smell ability.

"Cutting the stomach could change nerves in the stomach that affect the gut-brain pathway, so smell changes could be the key to the difference between the two surgeries – essentially the smaller size of the stomach might not be the factor that leads to weight loss, it is more likely due to the gut-brain pathway being reset," Dr. Peng contends.

The study, conducted in 2018, involved researchers from Otago's Departments of Food Science, Anatomy, and Mathematics/Statistics. Through systematic review/meta-analysis the research gathered all the related scientific papers that touched on body shape and smell ability, collecting information of 1432 individuals from empirical and clinical worldwide studies.

The research was supported by a Royal Society of New Zealand Marsden Fast-Start grant.

Dr. Peng hopes the research will increase awareness around the link between human's eating

behaviour and our senses. She is hoping to continue the line of research to investigate the reward-factor smell has in various body-shape groups.

More information: Mei Peng et al. Systematic review of olfactory shifts related to obesity, *Obesity Reviews* (2018). DOI: 10.1111/obr.12800

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