

Type 2 diabetes linked to worse performance on cognitive testing

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Credit: Darren Lewis/public domain

Type 2 diabetes is associated with worse performance on cognitive tests measuring abilities involved in the control of emotions, behaviours and thought, says a new study from the University of Waterloo.

The paper appears in *Psychosomatic Medicine*, and is the first comprehensive statistical summary of available studies that examine the link between type 2 diabetes and a reduction of certain cognitive abilities, known as executive functions. The executive functions inhibit

habitual thinking patterns, knee-jerk emotional reactions and reflexive behaviours such as making impulse purchases or automatically following social cues.

Researchers reviewed 60 studies comparing 9,815 individuals with type 2 diabetes to 69,254 controls without it and examined their performance on measures of executive function.

"This facet of brain function is particularly important because we rely on it when we are attempting to behave in a way that is contrary to our natural inclinations or what the environment impels us to do," said Corrie Vincent, a graduate student in the School of Public Health and Health Systems at Waterloo, and lead author on the study.

Health professionals encourage individuals with type 2 diabetes to consistently monitor their dietary choices, check their blood sugar and adhere to medication schedules. Type 2 diabetes is associated with decreased quality of life and a number of microvascular and macrovascular complications if not properly managed.

"The types of behaviours that are recommended to help individuals control type 2 diabetes are all things that do not come naturally to most people. Human beings have fairly reliable preferences for high-calorie foods and to resist medical routines that are inconvenient or time-consuming," said Professor Peter Hall, of the Faculty of Applied Health Sciences at Waterloo, and senior author on the study.

Many individuals with type 2 diabetes experience burnout in managing their disease. The inability to self-manage the condition is often a source of concern among family members, physicians and even the patients themselves.

"The problem is the fact that effective diabetes management relies pretty

heavily on executive function," said Professor Hall. "Essentially people with Type 2 diabetes may be hit with the double whammy of having more need for executive control, but—possibly because of the disease's effect on the brain—less intact resources for exerting it."

Recent studies suggest that older adults in particular can improve their executive function by engaging in cognitively stimulating activities and staying physically active have been shown help strengthen the area of the brain responsible for self-control. Seniors make up the largest demographic of patients with type 2 diabetes.

"Fortunately, there are a few things that can help optimize the brain structures that support executive function," said Professor Hall. "Aerobic exercise and cognitively challenging activities—such as learning new things, solving difficult puzzles and other problem solving activities—all help to keep your brain sharp. Aerobic exercise is probably the most important, however, because it has benefits to both the brain and the rest of the body simultaneously."

Approximately 600 million people live with type 2 [diabetes](#) worldwide, with nearly 800 million cases expected by 2030, making it one of the greatest global health concerns of modern times. More than 2 million Canadians currently live with [type 2 diabetes](#).

More information: *Psychosomatic Medicine*,
[journals.lww.com/psychosomatic ... Diabetes .99141.aspx](https://journals.lww.com/psychosomatic...Diabetes.99141.aspx)

Provided by University of Waterloo

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