

Learning a second language



Research shows improvements in the brain and quality of life for people with MS.

by **Lori De Milto**

People living with multiple sclerosis who learn a second language might be able to function better and feel better, according to a study by researchers in Austria.

The study, led by Rainer Ehling, MD, at the Medical University of Innsbruck, showed that learning a second language can expand some areas of the brain that were damaged by MS. The results were published in an article in PLOS One (December 2019).

Early in MS, the brain's gray matter may be damaged, causing cognitive symptoms, such as problems remembering things, finding the right word and processing information. Many people with MS will experience some changes in cognitive functioning during the course of their disease.

Study participants

- Ages 18-50
- People with MS:
 - » Patients at Medical University of Innsbruck
 - » Had relapsing-remitting MS for less than 10 years
- People without MS:
 - » Similar to people with MS in age, sex, education and English proficiency

» Relatives or friends of people with MS in the study and people who responded to ads at the Medical University of Innsbruck.

Changes in cognitive function make it harder for people living with MS to function physically, mentally, emotionally and socially. This is called health-related quality of life. Things like whether you feel sick or sad, or are in pain, and your energy level and mood are all part of health-related quality of life. Not feeling well physically and/or emotionally can interfere with your work, social activities and other regular daily activities. The impact of poor health-related quality of life on your ability to do the things you usually do can range from slight to extreme.

English language training program

Some studies have found an increase in gray matter volume and cognitive improvements after healthy adults learned a second language. The brain is made up of gray matter and white matter. The gray matter includes the nerve cells and several associated structures. The white matter consists of nerve fibers — which transmit messages to, from and throughout the brain — and myelin. Myelin is the fatty substance that surrounds and protects nerve fibers.

Ehling and his research team wanted to see if learning a second language could lead to similar changes in people with MS. The researchers work at the Medical University of Innsbruck, the University of Innsbruck, the Clinic for Rehabilitation Münster and the Karl Landsteiner Institut für Interdisziplinäre Forschung am Reha Zentrum Münster.

In this small study, 11 adults with MS and 12 adults who did not have MS and whose native language was German participated in an eight-week English language training program at the Medical University of Innsbruck. They spent three hours each week in a classroom. At home, they worked on vocabulary lists and extra listening and speaking activities.

Before and after the training program, the researchers measured the participants' gray matter and health-related quality of life. The researchers used magnetic resonance imaging (MRI) brain scans to measure gray matter and had participants complete a health-related quality of life survey called the 36-Item Short Form Health Survey.

More brain volume and function

At the beginning of the study, participants with MS had less gray matter in their brains than participants without MS. Despite this, participants with MS “were as successful in learning a [second language] in terms of listening comprehension, speaking fluency and vocabulary scores as their healthy counterparts,” say the study authors. Both groups had significant improvements in these areas.

After the English language training program, participants with MS had significantly more gray matter in areas of the brain related to short-term memory, learning and environment recognition. The researchers believe that the areas of the brain used in learning a second language can help people with early MS maintain cognitive function and may trigger

neuroplasticity.

Neuroplasticity is the brain's ability to adapt to new experiences and rewire itself after being damaged to preserve function. Functional MRI studies show that activities designed to improve higher-level language processes increase brain activity and stimulate neuroplasticity. These activities also help people improve their cognitive function.

Better quality of life

Learning a second language also led to significant increases in health-related quality of life.

Before the training program, participants with MS had much lower scores for mental health than participants without MS. Their mental health was much better after the training program. People without MS had about the same mental health scores before and after the training program. Physical health was the same before and after the training program for both groups.

The researchers concluded that the study “provides evidence for significant gray matter volume increases in people with MS and age- and sex-matched health controls following a short training in different language-related brain regions. These encouraging results prompt further investigation of the effectiveness of (second-language) learning on the improvement of distinct cognitive impairments in people with MS.”

More research is needed

This was a small study and the participants with MS had mild disabilities. More research is needed to find out how learning a second language might help relieve cognitive problems in MS.

Other ways to maintain and improve cognitive function



Photo: iStock

Learning a second language is only one way to engage your mind and optimize your cognitive function. Other useful activities include:

- Reading
- Creative writing
- Journaling
- Handiwork
- Board or card games
- Drawing or painting
- Crossword or jigsaw puzzles
- Learning to play an instrument

Social activities, such as participating in a support group, book club, or meetings at your church or synagogue, also help you engage your mind. Optimizing your cognitive health also helps you feel better in general.

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