

BIKE LABYRINTH SCIENTIFIC RESEARCH

EXERCISE & ALZHEIMER'S DISEASE

Can Exercise Improve Cognitive Symptoms of Alzheimer's Disease? A Meta-Analysis

This meta analysis* concluded that exercise training may delay the decline in cognitive function that occurs in individuals who are at risk of - or suffer from - Alzheimer's disease. It was further concluded that aerobic exercise (i.e. pedaling on a movement trainer for an extended period) has "the most favorable effect" in delaying the aforementioned cognitive decline.

**A meta analysis combines the results of previous studies to resolve uncertainty and improve estimates.*

Panza, G.A. et al. (2018). Can Exercise Improve Cognitive Symptoms of Alzheimer's Disease? A Meta-Analysis. Journal of the American Geriatrics Society 66 (3), p.487-495. DOI: [10.1111/jgs.15241](https://doi.org/10.1111/jgs.15241)

Effects of Physical Activity Training in Patients with Alzheimer's Dementia: Results of a Pilot RCT Study

A twelve week training study using MOTomed movement trainers resulted in Alzheimer's patients improving in talking ability, reaction time, hand-eye coordination and attention over a control group.

Holthoff V.A. et al. (2015) Effects of Physical Activity Training in Patients with Alzheimer's Dementia: Results of a Pilot RCT Study. PLoS ONE 10(4): e0121478. DOI: [10.1371/journal.pone.0121478](https://doi.org/10.1371/journal.pone.0121478)

BIKE LABYRINTH & GENERAL EXERCISE

Experience when Cycling in a Virtual Environment. A Qualitative Study of Physiotherapists' Experience Using Bike Labyrinth at Senior Care Institutions

A qualitative study in which physiotherapists from senior healthcare institutions in the Netherlands were interviewed about the experiences with their Bike Labyrinth systems. Therapists concluded that their Bike Labyrinth systems contributed to longer and more frequent cycling sessions in elder people, which resulted in increased mental and overall well-being. The physiotherapists also noticed clients empathizing with the tour videos, Bike Labyrinth being the focal point of positive changes in social life at their institutions and clients discussing the places covered in the virtual tours with each other and their therapists.

Wolters, F. (2014). Beleving bij het fietsen in een virtuele omgeving. Een kwalitatief onderzoek naar de beleving onder fysiotherapeuten die gebruik maken van Fietslabyrint bij ouderen in een zorginstelling. (Experience when Cycling in a Virtual Environment. A Qualitative Study of Physiotherapists' Experience Using Bike Labyrinth at Senior Care Institutions.) Study within the framework of the Health Technology program at Avans University of Applied Sciences in Breda. Article (in Dutch) available on demand.

Cycling in a Virtual Environment, An Incentive For Older People to Exercise Longer

In this study in which exercise behaviors of seniors aged 75-82 years were studied, it was concluded that cycling in a virtual environment using Bike Labyrinth has a positive effect on the self-chosen duration of cycling on an exercise trainer.

Haazen, M. (2015), Fietsen in een virtuele omgeving, een stimulans om ouderen langer te laten fietsen. (Cycling in a Virtual Environment, An Incentive For Older People to Exercise Longer.) Master thesis for the Master Specialized Physical Therapy at Avans+ in Breda. Thesis (in Dutch) available on demand.

Bike Labyrinth: a route to exercising more in hospital

In this study, Bike Labyrinth was experienced positively by older patients in hospital. Also, they wanted to keep using the system. Factors contributing to this attitude were expected health outcome, the attractiveness of product itself as well as the social benefits of using Bike Labyrinth.

Heilmann, S. (2015). Fietslabyrint: een route naar meer bewegen in het ziekenhuis - Navigatie middels Kwalitatief onderzoek. Master Geriatric Physical Therapy (2015). Article available on demand.

BIKE LABYRINTH & ALZHEIMER'S DISEASE

The quest for synergy between physical exercise and cognitive stimulation via exergaming in people with dementia: a randomized controlled trial

In this study, psychomotor speed in patients with dementia improved significantly over a period of 12 weeks compared to a control group, when treated with aerobic exercises and exergaming (a combination of aerobic exercises and cognitively challenging tasks at the same time). According to the authors this is an important finding as psychomotor speed is an important predictor for functional decline.

Karssemeijer, E.G.A. et al. (2019). The quest for synergy between physical exercise and cognitive stimulation via exergaming in people with dementia: a randomized controlled trial. *Alzheimer's Research & Therapy* 11 (3). DOI:[10.1186/s13195-018-0454-z](https://doi.org/10.1186/s13195-018-0454-z)

Experience in a Virtual Environment: A Study of Experience and Possible Cognitive Improvement of Elderly People with Mild Dementia Using Bike Labyrinth

In this study, researchers found that mildly demented clients using Bike Labyrinth connected their own life experiences with the routes that they cycled, and they often experienced cycling with Bike Labyrinth as actually cycling outside. All participants preferred cycling on a home trainer with Bike Labyrinth over using the trainer without Bike Labyrinth.

Van Gils, M., Schuurmans, L., & Wolters, F. (2014). Beleving in een virtuele omgeving. Een onderzoek naar de beleving en mogelijke cognitieve vooruitgang van licht dementerende ouderen bij het gebruik van Fietslabyrint. (Experience in a Virtual Environment: A Study of Experience and Possible Cognitive Improvement of Elderly People with Mild Dementia Using Bike Labyrinth.) Study within the framework of the Active Aging minor at Avans University of Applied Sciences in Breda. Article (in Dutch) available on demand.

The Bike Labyrinth: The Physiological, Social and Mental Effects of Weekly Cycling with Bike Labyrinth

In this study, over a period of two months the physiological, social and mental effects of cycling with Bike Labyrinth weekly were measured in older participants. It was concluded that cycling on a trainer has a positive effect on all three mentioned areas. However, it could not be stated this effect would have been different if the trainer was not connected to a Bike Labyrinth system, since there was no control group consisting of participants just cycling on a trainer without Bike Labyrinth.

Kieft, J., De Wit, K., & De Wit, L. (2014). Het Fietslabyrint. De fysiologische, sociale en mentale effecten van wekelijks fietsen met het Fietslabyrint. (The Bike Labyrinth: The Physiological, Social and Mental Effects of Weekly Cycling with Bike Labyrinth.) Study within the framework of the Biology, Nutrition and Health program at the Aeres University of Applied Sciences in Almere. Article (in Dutch) available on demand.

Effects of Activities with "Bike Labyrinth" and "Beleef TV" on the Behavior of People with Dementia Using the Example of the De Schutse Nursing Home in Coevorden - Netherlands

In this study, the effects of activities with Bike Labyrinth and Beleef TV on behavior of people with dementia were measured. The authors wondered if these activities could reduce agitation and aggression, strengthen the self-esteem and evoke feelings of joy. Unfortunately, no clear results were found. In some patients irritability was reduced, in others it was enhanced.

Otte, D. (2018). Effekte der Beschäftigungsangebote „Fietslabyrint“ und „Beleef TV“ auf das Verhalten von Menschen mit Demenz am Beispiel des Pflegeheims De Schutse in Coevorden - NL. Study within the framework of the Nursing (B.Sc.) program at the Osnabrück University of Applied Sciences in Lingen. Article (in German) available on demand