Many older adults are confronted with age-related health problems, such as cognitive impairment and dementia. Alzheimer’s disease is the most common cause of dementia. Prior to a diagnosis of Alzheimer’s disease, there is a potential transitional stage, in which people experience memory loss to a greater extent than expected for their age and education. This stage is referred to as amnestic mild cognitive impairment (MCI). In light of the growing number of older adults in the population, and their increased life expectancy, it is important that strategies for preventing cognitive decline are developed. The stage of MCI may be the optimum stage at which to intervene.

This thesis focuses on the effects of physical exercise and vitamin B supplementation on cognitive function in older adults with MCI. The thesis starts with a systematic review of previously published randomised controlled trials which examined the effect of physical exercise on cognition in adults with and without cognitive decline. It was concluded that exercise appeared to be beneficial to a certain extent, but that more methodologically high quality studies are needed. Next, the study protocol for the randomised controlled trial on the effects of one year of an aerobic walking program and supplementation with folic acid, vitamins B12 and B6, on cognitive function of community-dwelling adults with MCI is described. Secondary outcomes of the trial were quality of life, aerobic fitness, and homocysteine concentrations. The selection of subjects with MCI from the general population, is also described. Finally, the results of the randomised controlled trial are presented. The aerobic walking program induced some beneficial effects on cognitive function (memory and attention in women and memory in men) and quality of life in those participants who attended the walking sessions regularly. Moreover, a positive effect on aerobic fitness was observed. Effects of vitamin B supplementation on cognition and quality of life could not be demonstrated, except for a beneficial effect on information processing in women. Vitamin supplementation did, however, result in decreased homocysteine concentrations.