EXERCISE AND COGNITIVE IMPAIRMENT

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The Center for Disease Control describes cognitive impairment as:

- “Cognitive impairment is when a person has trouble remembering, learning new things, concentrating, or making decisions that affect their everyday life. Cognitive impairment ranges from mild to severe. With mild impairment, people may begin to notice changes in cognitive functions, but still be able to do their everyday activities. Severe levels of impairment can lead to losing the ability to understand the meaning or importance of something and the ability to talk or write, resulting in the inability to live independently.”

- “Cognitive impairment is not caused by any one disease or condition, nor is it limited to a specific age group. Alzheimer’s disease and other dementias in addition to conditions such as stroke, traumatic brain injury, and developmental disabilities, can cause cognitive impairment.”

Cognitive impairment can be associated with any form of mental handicaps including:

- Mental Illness, Dementia, Learning Disabilities, Stroke, or Post Traumatic Stress Disorder.

The definition is broad and can be applied to various illnesses, disorders or disability in which cognitive function is impaired.
THE IMPACT OF EXERCISE ON COGNITIVE FUNCTIONS:

The findings indicated that cognitively stimulating activities (i.e. education) build cognitive reserve that lasts over a limited time period; however physical activity increases cognitive reserve that is maintained over a longer time span.

The Impact of Exercise, Cognitive Activities, and Socialization on Cognitive Function: Results From the National Long-Term Care Survey

Abstract
Currently, there are no effective treatments for Alzheimer's disease and related disorders and age continues to be a robust risk factor. Thus, population aging in the United States may have catastrophic results if interventions are not found and implemented. This study examines possible associations between cognitive impairment and exercise, cognitive activities, and socialization. Cognitive activities, socialization, and exercise were assessed at baseline, and cognitive function was measured at baseline, 3-year, and 18-year follow-up. Controlling for baseline cognitive function, age, sex, education, diabetes, and hypertension, linear regression was performed. Engagement in cognitive activities was inversely associated with the onset of cognitive impairment at 5-year follow-up but was no longer significant at 10-year follow-up. Exercise was associated with a lower risk of cognitive impairment at 10-year follow-up but was not significant at 5-year follow-up. Associations with socialization were not statistically significant at either follow-up.

Results
Baseline (1994) characteristics of the total sample are presented in Table 1. Characteristics for the total sample, those with SPMSQ scores in 1994 and subjects who were cognitively intact or mildly impaired in 1994, are displayed. Subjects with SPMSQ scores are similar to the total sample. Approximately one-third were between the age of 75 to 79 at baseline and about one-third were male. The educational level of those who were cognitively intact/mildly impaired at baseline was slightly higher with 70.2% having at least some high school. Table 2 presents the baseline cognitive status of subjects who had SPMSQ scores in 1994.

Table 3 shows the results from the linear regressions on the MMSE scores in 1999 and the change between 1994 and 2006 on the SPMSQ, 5-year, and 18-year follow-up, respectively. Controlling for exercise participation, engagement in cognitive activities, and socialization, subjects who were living in the community and were cognitively intact or mildly impaired in 1994 and were subsequently tested in later waves of data collection were included in the analysis. Engagement in cognitively stimulating activities was associated with less cognitive impairment at the 5-year follow-up ($P = .019$) However, by the 10-year follow-up, although the association was in the right direction, results were not statistically significant. For exercise, there was no significant association between exercise and risk of cognitive impairment at the 5-year follow-up. However, at the 10-year follow-up, exercise showed a significant association with increased cognitive impairment ($P = .036$). Finally, for socialization, the associations at both time points were in the right direction but not significant.
THE IMPACT OF EXERCISE ON COGNITIVE FUNCTIONS:

Previously, academia had thought the opposite: that education and mental stimulation were more important than the latter. The results of this research warrant an ample discussion within the scientific community on the effects of social stimulation with an emphasis on exercise as a part of a prevention plan when dealing with those who might be at risk for cognitive impairment during elderly years.
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Table 3 shows the results from the linear regressions on the MMSE scores in 1999 and the change between 1994 and 2004 on the SPMRQ, 5-year, and 10-year follow-up, respectively, controlling for exercise participation, engagement in cognitive activities, and socialization. Subjects who were living in the community and were cognitively intact or mildly impaired in 1994 and were subsequently tested in later waves of data collection were included in the analysis. Engagement in cognitively stimulating activities was associated with less cognitive impairment at the 5-year follow-up ($p < .001$). However, by the 10-year follow-up, although the association was in the right direction, results were not statistically significant. For exercise, there was no significant association between exercise and risk of cognitive impairment at the 5-year follow-up. However, at the 10-year follow-up, exercise showed a significant association with less cognitive impairment ($p = .018$). Finally, for socialization, the associations at both time points were in the right direction but not significant.

Linear regressions were also performed controlling for, one at a time, cognitive activities, exercise, and socialization; exercise scores, cognitive activities, depression, medications, chronic diseases, and mental health status. These scores were significantly lower in the association with exercise participation, engagement in cognitively stimulating activities, and socialization.
THE IMPACT OF EXERCISE ON COGNITIVE FUNCTIONS:

The bottom line is that exercise affects cognitive function best over a long time span, even more so than education levels.
People with significant cognitive impairment need help to succeed within an exercise program.
ALTHOUGH EXERCISE BENEFITS COGNITIVE FUNCTION, IT IS DIFFICULT TO ENCOURAGE THOSE WHOM SUFFER WITH MENTAL HANDICAPS TO WORKOUT.

• People who struggle with cognitive impairment viewed physical exercise positively, and valued the link between being active and improved mental health. However, they found that the obstacles presented towards those suffering from mental illness included fears of discrimination and safety concerns.

• The researchers found that a sedentary lifestyle was mostly due to the lack of initiation of physical activity and verbal persuasion by the rehabilitation facilities management team. The participants offered ideas on improvement such as: increasing support and awareness of activity needs among health care professionals who manage psychiatric treatment centers, dividing the groups into sex segregated workout teams in order to limit social fears, and education regarding activity influences. With the installation of these suggestions, physical activity could improve on a larger scale within the mental health outpatient community.
UNDERSTANDING THE SIGNIFICANCE TO REGULAR EXERCISE:

When referring to this study, Harvard Health States, “Can a few laps around the block actually solve your emotional problems? Probably not, but a regular exercise program might help. A review of studies stretching back to 1981 concluded that regular exercise can improve mood in people with mild to moderate depression. It also may play a supporting role in treating severe depression.”
UNDERSTANDING THE SIGNIFICANCE TO REGULAR EXERCISE:

Additionally, Harvard Health also states, “They found that the people who exercised regularly after completing the study, regardless of which treatment they were on originally, were less likely to relapse into depression.

...walking fast for about 35 minutes a day five times a week or 60 minutes a day three times a week had a significant influence on mild to moderate depression symptoms. Walking fast for only 15 minutes a day five times a week or doing stretching exercises three times a week did not help as much...”
UNDERSTANDING THE SIGNIFICANCE TO REGULAR EXERCISE:

Effects of Exercise Training on Older Patients With Major Depression

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Background: Previous observational and interventional studies have suggested that regular physical exercise may be associated with reduced symptoms of depression. However, the extent to which exercise training may reduce depressive symptoms in older patients with major depressive disorder (MDD) has not been systematically evaluated.

Objectives: To assess the effectiveness of an aerobic exercise program compared with standard medication (i.e., antidepressants) for treatment of MDD in older patients, we conducted a 16-week randomized controlled trial.

Methods: One hundred fifty-six men and women with MDD (age 60-80 years) were assigned randomly to a program of aerobic exercise, antidepressants (sertraline hydrochloride), or combined exercise and medication. Subjects underwent comprehensive evaluations of depression, including the presence and severity of MDD using Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition criteria and Hamilton Rating Scale for Depression (HAM-D) and Beck Depression Inventory (BDI) scores before and after treatment. Secondary outcome measures included aerobic capacity, life satisfaction, self-esteem, anxiety, and dysfunctional cognitions.

Results: After 16 weeks of treatment, the groups did not differ statistically on HAM-D or BDI scores (P > .05). Adjustment for baseline levels of depression yielded an essentially identical result. Growth curve models revealed that all groups exhibited statistically and clinically significant reductions on HAM-D and BDI scores. However, patients receiving medication alone exhibited the fastest initial response; among patients receiving combination therapy, those with less severe depressive symptoms initially showed a more rapid response than those with initially more severe depressive symptoms.

Conclusions: An exercise training program may be considered an alternative to antidepressants for treatment of depression in older persons. Although antidepressants may facilitate a more rapid initial therapeutic response than exercise, after 16 weeks of treatment exercise was equally effective in reducing depression among patients with MDD.

Blumenthal et al concluded that exercise could be considered as an alternative to antidepressants if used regularly.
IN CONCLUSION:

• Bringing cognitively impaired individuals to exercise regularly could help improve mental function.

• The struggle is overcoming the barriers that block regular physical activity.

• Regardless of one’s current mental function, anyone could benefit from regular activity, especially when it comes to keeping sharp in later years.
RESOURCES:


