

Cause-Specific Mortality and Physical Fitness in Mental Disorders

Epidemiological and Interventional Studies

Akademisk avhandling

Som för avläggande av medicine doktorsexamen vid Sahlgrenska akademien, Göteborgs universitet kommer att offentligen försvaras i Lokal Europa, Konferenscentrum Wallenberg, Medicinargatan 20A, Göteborg, den 20 maj, klockan 9.00

av Malin Henriksson

Fakultetsopponent:
Professor Yvonne Forsell
Karolinska Institutet, Sverige

Avhandlingen baseras på följande delarbeten

- I. Nyberg J, **Henriksson M**, Åberg MAI, Rosengren A, Söderberg M, Åberg D, Kuhn HG, Waern M. Cardiovascular fitness in late adolescent males and later risk of serious non-affective mental disorders: a prospective, population-based study. *Psych Med*. 2017; 28:1-10. doi: 10.1017/S0033291717001763.
- II. **Henriksson M**, Nyberg J, Schiöler L, Hensing G, Kuhn HG, Söderberg M, Torén K, Löve J, Waern M, Åberg M. Cause-specific mortality in Swedish males diagnosed with non-psychotic mental disorders in late adolescence: a prospective population-based study. *J Epidemiol Community Health*. 2018; Jul;72(7):582-588. doi: 10.1136/jech-2018-210461.
- III. Nyberg J, **Henriksson M**, Åberg D, Wall A, Eggertsen R, Westerlund M, Danielsson L, Kuhn HG, Waern M, Åberg M. Effects of exercise on symptoms of anxiety, cognitive ability and sick leave in patients with anxiety disorders in primary care: study protocol for PHYSBI, a randomized controlled trial. *BMC Psychiatry*. 2019; Jun 10;19(1):172. doi: 10.1186/s12888-019-2169-5.
- IV. Nyberg J*, **Henriksson M***, Wall A, Vestberg T, Westerlund M, Walser M, Eggertsen R, Danielsson L, Kuhn HG, Åberg D, Waern M, Åberg M. Anxiety severity and cognitive function in primary care patients with anxiety disorder: a cross-sectional study. *Equal contribution of these authors. *BMC Psychiatry* 2021 Dec 9;21(1):617. doi: 10.1186/s12888-021-03618-z.
- V. **Henriksson M**, Wall A, Nyberg J, Adiels M, Lundin K, Bergh Y, Eggertsen R, Danielsson L, Kuhn HG, Westerlund M, Åberg D, Waern M, Åberg M. Effects of exercise on symptoms of anxiety in primary care patients: A randomized controlled trial. *J Affect Disord*. 2022 Jan 15;297:26-34. doi: 10.1016/j.jad.2021.10.006. Epub 2021 Oct 10.
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**SAHLGRENKA AKADEMIN
INSTITUTIONEN FÖR MEDICIN**



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Abstract

Mental illness is common and place a considerable health-related and financial burden on both the individual and society. Among those with anxiety disorders, an early age-of-onset is common and an increasing occurrence among youth is seen during the last decades. The overall aim of this thesis was to study mental disorders and the importance of cardiovascular fitness and the association with cause-specific mortality regarding both prevention and intervention. Papers I and II use data from several national registers to prospectively analyse if cardiovascular fitness associates with risk for developing mental disorders, and to estimate risk associated with specific causes of natural death in individuals with mental illness. In Paper I we could show that lower fitness in late adolescent males was associated with increased risk of psychotic disorders, anxiety and neurotic or stress-related disorders in adulthood. In Paper II we showed that young men diagnosed with non-psychotic mental disorders had a long-term increased mortality risk, in particular due to infectious and gastrointestinal conditions with up to 4-fold increased mortality risk for depressive and neurotic/adjustment disorders. Paper III is the study protocol describing our 12-week exercise intervention program for patients diagnosed with anxiety disorders within primary care. Papers IV and V emanate from this randomized, controlled clinical trial (RCT). In Paper IV cross-sectional baseline data from the RCT showed that severity of anxiety was associated with executive functions related to working memory. In Paper V we could show that the 12-week exercise program proved to be effective for patients with anxiety disorders in primary care, in both low and moderate- to high intensity exercise groups. In conclusion, our findings show that low cardiovascular fitness in adolescence increases the risk for mental disorders later in life and that men with mental illness have an increased mortality risk. We could also show that 12-week exercise program proved to be an effective treatment for individuals with anxiety disorders in primary care. These findings and the current increase in mental illness strengthen the view of physical exercise as an effective treatment and also highlights the importance of early preventive actions.

Keywords: Mental disorders; Anxiety Disorders; Physical fitness; Exercise; Intervention Studies; Primary Health Care; Dose-response; Randomized Controlled Trial

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