

Fitness, cognition and cardiovascular disease

– Epidemiological studies

Akademisk avhandling

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Avhandlingen baseras på följande delarbeten

- I Lindgren M, Börjesson M, Ekblom Ö, Bergstrom G, Lappas G, Rosengren A. Physical activity pattern, cardiorespiratory fitness, and socioeconomic status in the SCAPIS pilot trial - A cross-sectional study. *Preventive Medicine Reports* 2016;4:44-9.
- II Lindgren M, Åberg M, Schaufelberger M, Åberg D, Schiöler L, Torén K, Rosengren A. Cardiorespiratory fitness and muscle strength in late adolescence and long-term risk of early heart failure in Swedish men. *European Journal of Preventive Cardiology* 2017;24:876-84
- III Lindgren M, Eriksson P, Rosengren A, Robertson J, Schiöler L, Schaufelberger M, Åberg ND, Torén K, Waern M, Åberg M. Cognitive performance in late adolescence and long-term risk of early heart failure in Swedish men. *Submitted*
- IV Lindgren M, Robertson J, Adiels M, Schaufelberger M, Åberg M, Torén K, Waern M, Åberg ND, Rosengren A. Resting heart rate in late adolescence and long-term risk of cardiovascular disease in Swedish men. *Manuscript*

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Abstract

Physical activity and fitness have well established health bringing benefits. Low socioeconomic status is a known risk factor for cardiovascular disease. This association is commonly attributed to individual factors such as educational attainment, supposedly bringing about health-related behaviours. However, individual factors do not fully account for the observed health disparities, demanding further investigation. The aims of this thesis were to investigate how physical activity and fitness varies according to neighbourhood socioeconomic status among middle-aged individuals in the Gothenburg region, using data collected for the SCAPIS-pilot study in 2012. Additional aims were to identify the role of factors related to fitness and cognitive function in the development of heart failure and cardiovascular disease in youth, with an extended follow up via population registries. For this purpose, we used data from the Swedish military service conscription registry, containing information of about 1.8 million Swedish men. We separately studied the association between cardiorespiratory fitness, muscle strength, resting heart rate, and cognitive capacity for future cardiovascular disease, recorded in the national inpatient- and cause of death registries.

Data from the SCAPIS-pilot showed that inhabitants of low-SES areas have a lower general activity level, lower rate of fulfilment of the national physical activity guidelines, and 12% lower levels of cardiorespiratory fitness, on average. These disparities translate into increased risk of cardiovascular disease, found in previous studies. Conscripts with lower levels of cardiorespiratory fitness and muscle strength, lower cognitive test scores, and higher resting heart rate showed increased risk of developing heart failure at an early age. High resting heart rate was not associated with increased risk for any other of the cardiovascular outcomes that were studied.

In summary, the results of this thesis provide new knowledge about how physical activity and cardiorespiratory fitness are potential mediators of social inequalities in cardiovascular disease. In addition, new information regarding factors in early life that influence cardiovascular health in middle age is provided.

Keywords: Epidemiology, Physical activity, Fitness, Heart rate, Cognition, Heart failure

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