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## Physical Activity at Midlife and Health-Related Quality of Life in Older Men

A recent study in the *Archives*[1] investigated associations of midlife physical activity and health status in older age, and the results showed a strong association between midlife leisure time physical activity and successful survival and exceptional health status in later life. However, this cohort was limited to women, and although health-related quality of life (HRQoL) was assessed with the 36-Item Short-Form Health Survey (SF-36), these results were not reported. Because the SF-36, with its 8 domains, may give detailed information of the effects of physical activity on both physical and mental dimensions in old age aspects, we investigated long-term associations between leisure-time physical activity in midlife and HRQoL in old age in the Helsinki Businessmen Study.[2]

*See Invited Commentary at the end of this letter*

**Methods.** In 1974, clinically healthy middle-aged men (born in 1919-1934; median age, 47 years) of similar socioeconomic status were assessed with questionnaires and clinical and laboratory examinations as described previously.[2] The men were asked how they rated their present health on a 5-step scale ("very good," "good," "fair," "poor," and "very poor"), and a global description of leisure time physical activity was assessed with the following 4-step scale:

1. Activity mainly reading, watching television, or other sedentary activity.

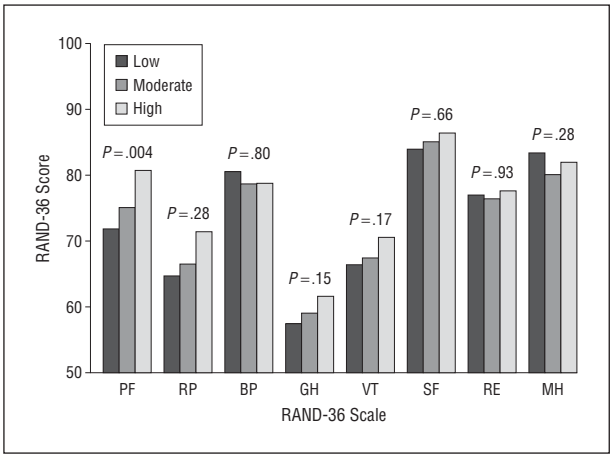


**Figure.** RAND-36 scores in old age in the year 2000 (n=552) according to leisure time physical activity (low, intermediate, or high) in healthy middle-aged men (in 1974). The scores are adjusted for age, smoking, self-rated health at baseline, and Charlson comorbidity index in old age. Numbers above bars denote *P* values between physical activity groups. BP indicates body pain; GH, general health; MH, mental health; PF, physical function; RE, role emotional; RP, role physical; SF, social function; VT, vitality.

2. Walking, cycling, gardening, or other light exercise weekly.
3. Jogging, skiing, tennis, or similar exercise weekly on a regular basis.
4. Regular vigorous/competitive exercise several times a week on a regular basis.

Details of physical activity were available for 782 clinically healthy men with various cardiovascular risk factors. Men answering yes to question 1 were categorized as low activity (n=148); yes to question 2, as moderate activity (n=398); and yes to questions 3 and 4, as high activity (n=236 [among whom only 11 men had a competitive activity level). After a 26-year follow-up in 2000 (median age, 73 years; range, 66-81 years), 552 men (91% of survivors at that time [deaths were verified from the Central Population Register]) could be reassessed using a mailed questionnaire. The questionnaire included queries about anthropometric measures, housing, prevalence of chronic diseases, medication, and lifestyle factors. The Finnish version of the RAND-36 Item Health Survey 1.0, which is practically the same as SF-36 and validated in the Finnish population,[3] was embedded into the questionnaire. From the responses, a summary comorbidity index was also assessed according to the method of Charlson et al.[4] The 8 domains of RAND-36 were physical function, role physical, bodily pain, general health, vitality, social function, role emotional, and mental health. Analyses were performed using NCSS 2004 statistical software (NCSS, Kaysville, Utah). Analysis of covariance was used to compare baseline activity groups, and $P<.05$ was considered statistically significant.

**Results.** In 2000, men with a low physical activity in midlife reported significantly higher prevalences of coronary artery disease ($P=.02$), cerebrovascular disorders ($P=.046$), and chronic obstructive pulmonary disease ($P=.04$). Of the adjusted HRQoL scales in old age (in the year 2000), only physical function was significantly related to physical activity in midlife (**Figure**). Further adjustment for individual diseases (history of coronary ar-

tery disease, cerebrovascular disease, heart failure, or chronic obstructive pulmonary disease, which were found to be different between groups in 2000), or the Charlson comorbidity index reduced but did not abolish the significance in physical function ($P = .01$ when diseases were included; $P = .02$ when the Charlson comorbidity index was included).

**Comment.** Leisure-time physical activity in midlife predicted better physical function in old age but was not significantly associated with mental or social dimensions of the HRQoL in this socioeconomically homogeneous male cohort. Moreover, the relationship was not explained, albeit attenuated, by diseases associated with less physical activity. Because the physical function score of the SF-36 has been shown to be a valid measure of mobility-disability,[5] more physical activity in healthy individuals in midlife may thus have an independent and specific impact for the prevention of disability in old age.

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## INVITED COMMENTARY

### Physical Activity Benefits Various Aspects of Healthy Aging

Physical activity is an effective approach to preventing chronic diseases.[1] We and others have also found that physical activity in midlife is related to healthy aging.[2-14] In this issue of the *Archives*, Savela and colleagues report a significant positive association between higher midlife physical activity and greater physical function in older men; activity was not associated with other components of health-related quality of life. A major strength of this study is its long follow-up and detailed measures of quality of life in older age. However, 2 limitations are notable. Assessment of physical activity was limited, with 3 broad categories; thus, measurement errors might have attenuated associations. Second, the sample was relatively small with 552 participants.

In our previous study,[14] as Savela et al note, we did not consider individual quality of life components; our interest was in understanding overall successful survival—a clear public health priority. Nonetheless, for comparison, in our data, midlife physical activity was related to the SF-36 mental health index and to physical function (2 components in our definition of successful survival, along with chronic diseases and cognition). Adjusted odds ratios (95% confidence intervals) for the fifth vs first quintile of physical activity were 0.43 (0.38-0.49) ($P$ value for trend, $<.001$) for physical function and 0.80 (0.72-0.90) ($P$ value for trend, $<.001$) for mental health. Overall, however, despite relatively low power, the study by Savela et al adds to the growing evidence that greater physical activity in midlife contributes to aspects of healthy aging.

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