

Total mortality after changes in leisure time physical activity in 50 year old men: 35 year follow-up of population based cohort

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STUDY QUESTION How does increased physical activity after middle age influence mortality and what is the size of the effect in comparison with smoking cessation?

SUMMARY ANSWER Increased physical activity in middle age increases longevity after an induction period of up to 10 years of no benefit. After 10 years of follow-up, however, increased physical activity between the ages 50 and 60 halved mortality compared with continued inactivity, and the effect was similar to that seen after smoking cessation (compared with continued smoking).

Participants and setting

Participants in our study were 50 year old men in Uppsala, Sweden, who were examined in 1970-3 and re-examined at ages 60, 70, 77, and 82 years.

Design, size and duration

We individually linked the 2205 men in this population based cohort with the population register. At the end of follow-up in 2006, 1329 of the men had died. Information on physical activity was obtained by questionnaire at each examination and was categorised as low, medium, and high. We used time updated variables in our analyses, taking changes over time into account. We studied changed physical activity between 50 and 60 years in 1759 men who participated in both examinations, of whom 998 died.

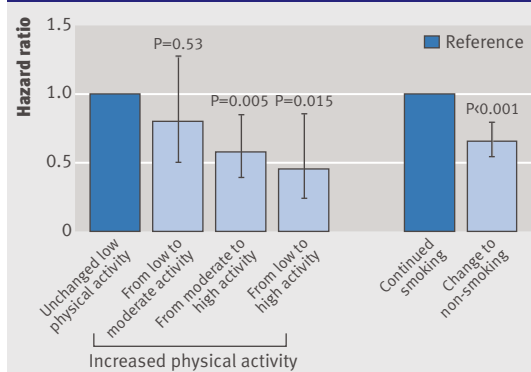
Main results and the role of chance

Mortality (per 1000 person years) was 27.1, 23.6, and 18.4 in the groups with low, moderate, and high physical activity, respectively. Men who increased their physical activity level between the ages of 50 and 60 continued to have higher mortality during the first five years of follow-up compared with unchanged high physical activity (adjusted hazard ratio 2.64, 95% confidence interval 1.32 to 5.27). Given the small numbers of deaths, we are reluctant to place a strong emphasis on this higher risk, especially as mortality was not higher than that in men who continued to be sedentary. After 10 years of follow-up, increased physical activity was associated with reduced mortality to the level of men with unchanged high physical activity (adjusted hazard ratio 1.10, 0.87 to 1.38). The impact of increased physical activity on mortality was on a par with the effect of smoking cessation and independent of potential confounders (see figure).

Bias, confounding, and other reasons for caution

We took account of changes over time in potential

EFFECT OF CHANGED PHYSICAL ACTIVITY AND SMOKING STATUS ON MORTALITY RISK 10 YEARS LATER



confounders including smoking, obesity, self perceived health, and morbidity, and in classic risk factors for mortality including hypertension and total cholesterol concentration. We also adjusted our estimates for socioeconomic group and educational level. Potential sources of bias that might conservatively influence our results include assessment of physical activity by questionnaire and adjustment for variables that can be regarded not only as confounders but also as intermediates on the causal pathway—such as perceived health, body weight, and diabetes.

Generalisability to other populations

The generalisability to women is yet to be determined. Mechanisms and reasons for an active choice to increase physical activity are not fully understood and may be different in other populations.

Study funding/potential competing interests

All researchers are independent of the study funders, the Swedish Research Council.

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