

20-year study shows that higher levels of fitness reduce the risk of developing of diabetes and prediabetes

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A new study analysing fitness levels across two decades is the longest study demonstrating that higher levels of cardiorespiratory fitness (CRF) reduce the risk for developing prediabetes or diabetes. The study, which adjusts for changes in body mass index over time, provides strong evidence supporting the commonly accepted dogma that fitness is beneficial in reducing the risk for prediabetes/diabetes. The research is published in *Diabetologia* (the journal of the European Association for the Study of Diabetes [EASD]) by Dr Lisa Chow, University of Minnesota, Minnesota, USA, and colleagues.

A number of previous studies have shown people who maintain or increase their CRF through adulthood have a lower risk of developing diabetes, abnormal metabolic measures, cardiovascular disease and cardiovascular mortality than those whose CRF declines. However, these previous studies are limited for several reasons, including use of a largely male population, measurement of [fitness](#) over a limited duration (5-7 years) or measurement of fitness at varying intervals prospectively. In this new research, the authors used data from the Coronary Artery Risk Development in Young Adults (CARDIA) study to objectively and rigorously analyse the link between CRF and development of either prediabetes or diabetes over a 20-year period.

The authors proposed that higher fitness levels, even after adjusting for changes in BMI, would be associated with reduced risk for developing

incident prediabetes/diabetes. The CARDIA study consisted of 4,373 black and white women and men who were recruited and examined in 1985-1986 from four US communities (Birmingham, AL; Chicago, IL; Minneapolis, MN and Oakland, CA) and balanced on age, race, sex and educational attainment. CRF was assessed prospectively by treadmill exercise testing at baseline (Year 0 [Y0]: participants aged 18-30 years), early adulthood (Y7: the same participants now aged 25-37 years) and again at middle age (Y20: the same participants, now aged 38-50 years). Development of prediabetes/diabetes was ascertained during scheduled visits (at Y0, Y7, Y10, Y15, Y20, and Y25) for the CARDIA study.

The main finding is that higher CRF is associated with lower risk for developing prediabetes and diabetes, even when adjusting for prospective changes in [body mass index](#). Although higher CRF may be influenced by genetic factors, [physical activity](#) is well known to increase CRF. This study found that when using treadmill exercise testing to measure CRF, an 8-11% higher fitness level reduced the risk for developing prediabetes or diabetes by 0.1%. For context, achieving this higher level of fitness was examined by another study* and required either vigorous physical activity for 30 minutes daily, 5 days per week or moderate physical activity for 40 minutes daily, 5 days per week. While the CARDIA study found that the overall reduction in risk for prediabetes/diabetes was modest at the individual level, these changes remain significant at the population level where small changes in a large number of individuals may lead to large absolute reduction in prediabetes/diabetes.

The authors conclude: "This study is clinically relevant as it provides evidence to support commonly accepted dogma that fitness is beneficial in reducing the risk for prediabetes/diabetes. As this benefit remained significant even when adjusting for BMI, exercise programmes remain critically important for reducing the development of prediabetes and [diabetes](#)."

More information: Lisa S. Chow et al. Twenty year fitness trends in young adults and incidence of prediabetes and diabetes: the CARDIA study, *Diabetologia* (2016). [DOI: 10.1007/s00125-016-3969-5](https://doi.org/10.1007/s00125-016-3969-5)

* AbouAssi H, Slentz CA, Mikus CR, et al. (2015) The effects of aerobic, resistance, and combination training on insulin sensitivity and secretion in overweight adults from STRRIDE AT/RT: a randomized trial. *Journal of Applied Physiology* 118: 1474-1482

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