

Low muscle strength in adolescence linked to increased risk of early death

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Low muscle strength in adolescence is strongly associated with a greater risk of early death from several major causes, suggests a large study published on the *British Medical Journal* website today.

The effect is similar to well established risk factors for early death like being overweight or having high blood pressure, leading the authors to call for young people, particularly those with very low strength, to engage in [regular physical activity](#) to boost their muscular fitness.

High [body mass index](#) (BMI) and [high blood pressure](#) at a young age are known risk factors for [premature death](#), but whether muscular strength in childhood or adolescence can predict mortality is unclear.

So a team of researchers, led by Professor Finn Rasmussen at the Karolinska Institutet in Sweden, tracked more than one million Swedish male adolescents aged 16 to 19 years over a period of 24 years.

Participants underwent three reliable muscular strength tests at the start of the study (knee extension strength, handgrip strength and [elbow flexion](#) strength). BMI and blood pressure were also measured. Premature death was defined as death before age 55 years.

During the follow-up period, 26,145 participants (2.3% of the group) died. Suicide was the most common cause of death (22.3%) compared with cardiovascular diseases (7.8%) or cancer (14.9%).

High muscular strength was associated with a 20-35% lower risk of early death from any cause and also from cardiovascular diseases, independently of BMI or blood pressure. No association was seen with cancer deaths.

Stronger adolescents also had a 20-30% lower risk

of early death from suicide and were up to 65% less likely to have any psychiatric diagnosis, such as schizophrenia and mood disorders. These results suggest that physically weaker individuals might be more mentally vulnerable, say the authors.

In contrast, male adolescents with the lowest level of muscular strength showed the greatest all-cause mortality and also the greatest mortality in cardiovascular disease and suicide before age 55 years.

Death rates from any cause (per 100,000 person years) ranged between 122.3 and 86.9 for weakest and strongest adolescents respectively. Rates for cardiovascular diseases were 9.5 and 5.6 and for suicide were 24.6 and 16.9.

The authors say that low muscular strength in adolescents "is an emerging risk factor for major causes of death in young adulthood, such as suicide and cardiovascular diseases." The effect sizes of these associations "are similar to classic [risk factors](#) such as body mass index and blood pressure," they add.

They suggest that muscular strength tests, in particular handgrip strength, could be assessed with good reliability in almost any place, including clinical settings, schools and workplaces.

They also support the need for regular physical activity in childhood and adolescence, saying: "People at increased risk of long term mortality, because of lower [muscular strength](#), should be encouraged to engage in exercise programmes and other forms of physical activity."

More information: Muscular strength in male adolescents and premature death: cohort study of one million participants, *British Medical Journal*.

Provided by British Medical Journal

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