

The Research File



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The impact of socioeconomic status in childhood on physical capability in adulthood

The ability to perform everyday physical tasks is important in every individual's life. With age, grip strength, walking speed, time to rise from a chair and standing balance performance deteriorate.^{1,2} These objective measures of physical capability levels provide an indication of current health and are associated with subsequent health outcomes in older people.

Consistently, numerous studies have reported a negative impact of low socioeconomic status on health in adulthood; increased mortality rates and higher chronic disease rates are observed in socioeconomically disadvantaged groups. There is also evidence that individuals who were socioeconomically underprivileged as children have higher chances of poorer health outcomes in adulthood, regardless of their socioeconomic status as adults. This effect may be attributed to many factors; including growth and nutrition during childhood



which may reduce the highest level of physical capability obtained in early adulthood. The negative effects of low socioeconomic status may also accumulate throughout the course of life. In their systematic review Birnie et al. explore the influence of socioeconomic status in childhood on physical capability levels in adulthood.²

The authors conducted a systematic review which led, after the addition of unpublished data, to the inclusion of 19 studies in meta-analyses. Two authors independently extracted data on the study population, baseline characteristics, details about childhood socioeconomic position, physical capability measures, and potential confounders. Data from



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eight out of nine UK cohort studies participating in the HALCYon collaboration (<http://www.halcyon.ac.uk/>) were included in addition to unpublished data provided by another 9 studies which were identified as having relevant data to test the specified hypotheses.²

Measures that were used to assess childhood socioeconomic position were father's occupation, childhood socioeconomic environment (rated on a three point scale from good to poor or from high to low), and parental education (measured as the highest level of education completed or as a length of time of education). In terms of outcomes, the following measures of physical capability were considered - grip strength, walking speed, time needed to complete five chair rises and ability to balance for 5 seconds on one leg.²

Evaluation of the associations between childhood socioeconomic position and physical capability measures was performed using regression models. Furthermore, adjustments for indicators of adult socioeconomic status and current body size were performed to verify whether associations identified in the systematic review could be explained by the continuity of socioeconomic status through life and body size. Meta-analyses were performed using random effects models as a large degree of heterogeneity was expected.²

The meta-analyses results showed consistent evidence of associations between lower childhood socioeconomic

position and lower physical capability levels (i.e. weaker grip strength, slower walking speed, longer chair rise time, inability to balance). When adjusted for adult socioeconomic position, associations were reduced substantially for all outcomes. Moreover, further adjustment for body size additionally attenuated the associations for grip strength and standing balance; whereas the relationship with chair rise time and walking speed were partially maintained after the adjustment for current body size and indicators of adult socioeconomic status.²

Overall, modest relationships between indicators of childhood



socioeconomic status and objective measures of physical capability levels in later life were found. Individuals having poorer socioeconomic status as children were more likely to have reduced grip strength, walk slower, and perform worse in chair rise time test and standing balance test. After adjustments for body size and indicators of adult socioeconomic status, the relationship between socioeconomic status and walking speed and chair rise time was still present. The results of this study indicate the importance of socioeconomic status in early life for physical capability levels in adulthood; however the results should be interpreted with caution due to unexplained heterogeneity between studies.²

References

- 1 Cooper R et al. Age and gender differences in physical capability levels from mid-life onwards: the harmonisation and meta-analysis of data from eight UK cohort studies. *PLoS One* 2011; 6(11):e27899.
- 2 Birnie K. et al. Childhood socioeconomic position and objectively measured physical capability levels in adulthood: a systematic review and meta-analysis. *PLoS One*. 2011 Jan 26;6(1):e15564.

What have we learned?

- Lower socioeconomic status in childhood is associated with moderate reductions in physical capability in later life.
- Adults that grew up in lower socioeconomic position were more likely to have poorer grip strength, lower walking speed, increased time needed to complete five chair rises and they performed worse on standing balance test.
- Policies aimed at reducing socioeconomic inequalities in childhood may have benefits in preserving physical capability levels in later life.