

Adult children's education and physical and cognitive health trajectories of older parents in Denmark

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Background

The relationship between education and health is one of the most well-established in population studies (1). At the individual level, having a higher level of education is associated with better cognition and physical health, lower levels of disability, less chronic conditions and increased longevity (2–4). Researchers interested in health inequality also focused on how partners influence each other in terms of health outcomes (5) and how the resources of the older generations influence the health of the younger generations (6). However, only a few studies examined the opposite relationship: intergenerational transmission of human capital from younger to older generations and, particularly, from the children to the parents. The studies conducted so far focused on different countries and contexts: Taiwan (7), Sweden (8–10), USA (11) and South Africa (12), including also other measures of adult children's socioeconomic status such as occupation and income (9) and trying to disentangle the causality of this relationship (10). Overall, they show that the education level of the children, when they are adult, is positively associated with the longevity of their parents. The relation holds also when the socioeconomic characteristics of the parents are controlled for (8,9). The possible explanations for this intergenerational link suggest that parents of more educated adult children have an easy access to health-related advice, more frequent contacts with health care professionals and direct or indirect positive spillover effects of the children high education on their own health behaviours. Understanding how children's education affect their parents' health may

contribute to understand possible pathways of this intergenerational transfer of human capital. To the best of our knowledge, only two studies focused on relationship between the children's educational attainment and health outcomes of the parents. Lee (2018) investigated how the cognitive deterioration of older parents in South Korea correlate with their children's education and found a negative association for both parents. However, the magnitude of the relationship reduced when controlling for parent's perceived life satisfaction (13). Yahirun et al. (2017) assessed changes in physical health in Mexico finding no significant association with physical health decline over time even if higher education levels of the adult children resulted associated with increased parental longevity (14).

Aim of the project

The aim of this project is to understand whether the education level of the children in their adult age (a) is associated to physical and or cognitive decline of the old parents; (b) this relationship persists also when controlling for parent's socioeconomic characteristics and health behaviors; (c) there is a gender difference on both sides of the transmission, namely if offspring of one sex transmit their human capital more to the father or to the mother and if the sex of the parent influences the ability to receive such transfers.

Data and methods

We will use the first six waves of the Survey of Health, Aging and Retirement in Europe (SHARE) for Denmark. The choice of focusing only on one country, rather than on the many countries included in SHARE, derives from the possibility to link the Danish SHARE data to the Danish National Registry (REGLINK-SHAREDK). It allows us to know the exact time to death of each person and to have more precise information on children's and parents' socio-economic position. We will include in the study all the individuals with at least two appearances in the six waves, who have at least one child aged 25 years or more. The age cutoff is necessary to be sure that the education level is the

highest achieved education. We will consider the information about parents' health and their children's socioeconomic position, in particular educational attainment. Physical status will be evaluated according to the ability of the parents to perform basic activities of daily living (ADL), while cognition will be evaluated from the memory scores calculated according to the results on cognitive tests conducted on the participants.

Latent classes of physical as well as cognitive functioning trajectories over the follow-up period will be constructed by using Growth Mixture Model (GMM) in order to identify different subpopulation of longitudinal changes. Multinomial logistic regressions will be used to estimate the odds of belonging to different physical and cognitive trajectory classes. Other than children's educational attainment (main predictor), possible confounders such as socioeconomic position of the old parents will be included in the models. The analysis will be conducted for the entire population and separately by gender, in order to understand if intergenerational transfer of human capital from children to parents is gender-specific.

Expected findings

We expect to find a significant relationship between adult children's educational attainment and parents' cognitive and physical health trajectories. In Denmark we could also expect the intergenerational transfer of human capital to function according to mechanisms similar to the case of Sweden (8–10) which is very similar to Denmark in terms of family-organization and lifestyle habits, and where it was found that children's education, rather than occupational class or income, is associated with parents' longevity.

We expect that the strength of the correlation with both physical and cognitive health would be reduced by including the educational attainment of the parents' as a confounding factor.

The gender of the child is not expected to play a role in this intergenerational process, similarly to what have been shown for Sweden (8–10). Finally, we feel we are not able to make any speculation

on the difference between the gender of the parents and the gains in health potentially deriving from their children.

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