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Associations of schooling type, qualification type and subsequent health in mid-adulthood: evidence from the 1970 British Cohort Study

Keyao Deng, Liam Wright, Richard Silverwood, Alice Sullivan, David Bann

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Centre for Longitudinal Studies, UCL Social Research Institute, University College London, London, UK

Correspondence to
Keyao Deng, Centre for Longitudinal Studies, 55-59 Gordon Square, University College London, London, WC1H 0NU, UK;
alice.deng.17@ucl.ac.uk

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ABSTRACT

Background Education is thought to benefit health. However, existing studies have predominantly focused on educational attainment—the type of institution attended has been overlooked, despite being an important indicator of education resources, quality, and future socioeconomic outcomes. In this study, we investigated associations between type of high school or university attended and multiple adult health outcomes.

Methods The 1970 British Cohort Study was used (n=8107). Associations between high school (comprehensive, grammar, private) and university (classified as normal or higher status (Russell Group)) attended with 10 health outcomes that capture cardiometabolic risks, physical capabilities and cognitive function at age 46 years were investigated. Multivariable regression models were used, adjusting for sex and childhood socioeconomic, health and cognitive factors.

Results Both private school and higher-status university attendance were related to favourable health outcomes. After adjusting for potential confounders, associations between private school attendance and cardiometabolic risks remained; associations for higher-status university attendance and cognitive function remained, while associations with other outcomes were largely attenuated. For example, after full adjustment, private school attendance was associated with a 0.14 SD (95% CI: 0.04 to 0.23) lower body mass index and higher-status university attendance with a 0.16 SD (0.07 to 0.26) better memory recall.

Conclusion The type of educational institution attended was associated with multiple health outcomes, suggesting it might be a relevant factor to consider in future health inequality research—particularly in contemporary populations which have high overall attainment levels. Further research is warranted to test the causal nature of this relationship and its generalisability to other contexts.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Existing studies have repeatedly found higher education attainment to be associated with better subsequent health.
⇒ Few have investigated other aspects of education; for example, the type of institution attended appears to impact educational resources and subsequent socioeconomic outcomes.

WHAT THIS STUDY ADDS

⇒ The type of school or university attended was related to multiple subsequent health outcomes.
⇒ Controlling for potential confounders, attending private rather than comprehensive high school was associated with more favourable cardiometabolic outcomes at age 46 years.
⇒ Higher-status (Russell Group) university attendance was associated with better cognitive function at age 46 years compared with normal-status university attendance.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ The type of educational institution attended could be considered a distinguishing factor in future health inequality research.
⇒ This may be particularly so in contemporary populations which have high overall educational attainment levels where attainment alone becomes a less distinguishing feature of the population.

INTRODUCTION

A well-documented relationship between education and health exists, with people of higher education typically having lower mortality and morbidity rates compared with their less educated counterparts.[1 2] Education is associated with a wide range of physical and mental health outcomes,[3 4] with some evidence that such links are causal in nature.[5 6] However, most studies investigating this education-health association have focused solely on educational attainment, ignoring other aspects of education.

The type of education (ie, attending a higher-status institution as opposed to a normal-status institution) an individual attends tends to affect both educational and other later-life outcomes, in particular earnings and occupation.[7] In the UK, the schooling system consists of two major types of schools: private (independent) and public (state funded). The private schools are characterised by having minimal state involvement, more resourced and being highly socially and economically selective.[8] Only around 7% of British students are attending private schools, and the participation is concentrated at the top of the family income distribution.[9] Private school attendance was found to be associated with a greater economic premium in the labour market.[8]

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Several potential mechanisms may link education type and subsequent health. Higher-status elite institutions are often characterised by having greater per-pupil resources and smaller class sizes and providing well-equipped facilities and wider range of activities,[10] which may affect the subsequent health of its attendees through several mechanisms. First, attendance at a higher-status institution may lead to improved labour market outcomes[8] which in turn may benefit health.[11] Net of economic pathways, peers at these institutions may display different patterns in health behaviours and cultural norms,[12 13] which could influence the health behaviours of those attending these institutions given the importance of peer effects on health behaviours.[14 15] Finally, higher-status institutions may have more cognitively stimulating environments through having smaller class sizes, more experienced teachers and high-achieving peers[16 17]; this may benefit cognition in adolescence, across adulthood and ultimately health in midlife.[18] This literature suggests multiple potential mechanisms linking the type of education with subsequent health.

Fewer studies have explicitly addressed this association between the type of education and subsequent health.[19–22] Using self-rated health in mid-adulthood as the main outcome measure, most studies have found a small association between attending a selective school and subsequent health, with those attending more selective schools reporting higher self-reported health.[19–22] The magnitude and direction of the associations tend to vary across different health outcomes and few used objective measures. It was also found that attending an advantageous secondary school or a highly selective university was associated with better cognitive function in old age.[16 17]

Overall, only a few studies investigated the effect of the type of education on subsequent health directly. The classification of education type varied across studies, and only one of the studies investigated at both school and university levels simultaneously.[22] Moreover, self-rated health was used as the measurement for most studies examining overall health, while the association between education type and health might differ by health outcome. Also, reporting bias of self-rated health tends to be affected by an individual's education level, implying that the estimated association could be underestimated as better-educated individuals tend to rate a given health state more negatively.[23] Prior studies have not extensively addressed the potential impact of this reporting bias. These factors highlight the need to use multiple objective health outcomes.

Thus, we investigated the association between the type of education and subsequent health in mid-adulthood, using data from a UK-wide longitudinal study with participants born in 1970 and objective health measures. Multiple health outcomes were investigated, enabling several dimensions of health to be considered and enabling effect sizes to be compared across outcomes.[24] Private high school (secondary school) and higher-status university attendance were investigated in particular. We hypothesised that private high school or higher-status university attendance would both be associated with better health in mid-adulthood, and this association would only partly be explained by preceding confounders.

METHODS

Data and sample

We used data from the 1970 British Cohort Study (BCS70), a representative UK cohort born in a single week of 1970.[25 26] This involved 17 196 babies at baseline, with 10 follow-up sweeps conducted when the cohort members were aged 5, 10, 16, 26, 30, 34, 38, 42, 46 and 51 years. At the 10th sweep (conducted in 2016–2018, cohort members aged 46–48 years), 12 368 participants were invited to participate, and 8581 (69.4%) were interviewed.[27] Trained interviewers made initial contact and conducted core interviews, including a cognitive assessment module. This was followed by nurse visits at which biomeasures such as height and weight, blood pressure and grip strength were collected.[27]

Measures

Type of high school and university attended: The type of high school attended was derived from a headteacher's questionnaire and school census when the cohort members were aged 16 years, and a retrospective question was asked when the cohort member was aged 42 years if the former two were missing.[28] We categorised school types into private schools, grammar schools, and comprehensive and other schools. Participants with special education needs (n=68) and missing high school types (n=406) were excluded from the sample (online supplemental figure S1). For the type of university attended, cohort members who had a degree were asked about their first university attended at age 42 years (sweep 9, conducted in 2012).[28] Those who attended their first university from the Russell Group of universities were categorised as attendeding a higher-status university, while those who attended all other universities were categorised as attended a normal-status university. The Russell Group of universities includes 24 self-selected institutions which have often been considered as the most prestigious institutions in the UK, with attendance of these institutions being associated with higher graduate earnings.[29] We further classified those who did not attend university into two groups according to their highest qualification obtained (no qualification/The General Certificate of Secondary Education (GCSEs) only; A-levels/diplomas).

Health outcomes: Multiple indicators of health were included since we hypothesised that education could affect multiple domains of health.[30] 10 health outcomes that capture cardiometabolic risks, physical capabilities and cognitive function were investigated. These health domains were selected as they were found to be associated with education in previous literature, and different mechanisms might explain these associations.[4 31] Improved health behaviours through peer effect in higher-status institutions might be a potential contributing factor to subsequent health. This includes behaviours such as alcohol consumption and physical activity which are associated with cardiometabolic outcomes such as body mass index (BMI) and blood pressure as well as physical function.[14 15] Higher-status institutions might benefit the cognitive outcomes of the students;[16 17] hence, cognitive function was also included. All outcomes were measured at the 10th wave of BCS70 when the cohort members were aged between 46 years and 48 years.

1. Cardiometabolic risks. BMI: Cohort members' height and weight (in centimetres and kilograms, using Leicester stadiometer and Tanita BF-522W scales) were taken during the nurse visit, and BMI was later calculated using the objective height and weight.[27] Blood pressure: Systolic blood pressure was used, as it has been suggested as a better predictor of cardiovascular risks compared with diastolic blood pressure.[32] Three measurements of systolic blood pressure were taken during the nurse visit, and the average of the second and third reading was used in the analysis. Pulse: Pulse has been used as a common indicator of health, associated with risks of cardiovascular diseases and coronary events.[33] Three measurements of pulse were taken during the nurse visit, and the average of the second and third reading was used.

2. Physical capability. Grip strength: Three measurements of grip strength (in kilograms) were taken using a Smedley spring-gauge dynamometer during the nurse visit. The maximum grip strength of the dominant hand was used.[34] Standing balance: Cohort members were asked to raise one foot off the ground a few inches and balance on their other leg with eyes opened, and time in seconds was recorded. This was repeated with eyes closed if the participants reached 30 s in the eye-opened task.
3. Cognitive function: Four cognition tests were conducted during the core interview session—word list recall, animal naming, letter cancellation and delayed word list recall. These tests were intended to capture attention, memory, verbal fluency and executive function of the participants.[35] The number of words/animals recalled/named or the performance score was recorded and analysed as separate outcomes.

Potential confounders

Potential confounders collected in BCS70 sweep 3 (at age 10): Childhood socioeconomic position (SEP), childhood health and childhood cognitive ability were adjusted, as these factors tend to be associated with both higher-status institution attendance and subsequent health.[28 36 37] Indicators of childhood SEP include parental occupational class (measured by Registrar-General's Social Classes), parental education level (having degree/not) and household income (categorical gross weekly income). Childhood health was measured by whether the participant has missed school due to illness and the presence of a disability that interferes with ordinary life, both measured by binary variable. Childhood cognitive ability was measured by five tests taken at age 10 years, namely, the Shortened Edinburgh Reading Test, Friendly Maths Test, Pictorial Language Comprehension Test, Spelling Dictation task and British Ability Scales, as previously described.[35] These tests captured a wide range of cognitive abilities, such as word recognition and general mathematical competence.

Analytical strategy

First, descriptive statistics were generated, and t-tests and χ^2 tests for trend were used to compare health outcomes across different education types. We then used multivariable regression models to examine the association between the type of high school/qualification and each of the health outcomes. To aid comparability across outcomes, z-scores were calculated and used in the analysis. We did not stratify by sex or include education-sex interactions as there is little evidence of gender interaction in the association between educational quality and health.[22] All other potential confounders were then additionally adjusted for (fully adjusted models). For the analysis of qualification/university type, high school type was also adjusted for. Full information maximum likelihood (FIML) was used to account for missing data under the assumption of 'missing at random', which assumes that missingness does not depend on unobserved data given observed data. The use of FIML prevents loss in statistical power and reduces limit bias. To aid comparison across outcomes, the signs of the cardiometabolic outcomes (BMI, blood pressure and pulse) were reversed; hence, positive values indicate more favourable outcomes on average.

Supplemental and sensitivity analyses

We first examined whether associations found in the main analyses were explained by confounding due to cognition specifically, by fitting additional models adjusted for sex and cognitive ability at age 10 years. We then explored whether the results could be explained by residual confounding. As there is difficulty in fully controlling for individual differences in cognitive ability, we conducted analyses adjusting for cognitive ability at age 5 years in addition to sex, childhood SEP, childhood health and cognitive ability at age 10 years that were adjusted in the main analysis. Further analyses were conducted adjusting for the home learning environment and parental educational aspirations in addition to the potential confounders adjusted in the main analysis. This includes variables on how often the parent reads to the child (measured at age 5 years), how often the child goes to museums/libraries (age 10 years), whether the parent has met the child's teacher in the past year (age 10 years) and whether the parent is interested in the child's education (age 10 years, rated by child's teacher).

Finally, to examine the influence of missing data on our findings, additional sensitivity analysis was conducted using participants with complete outcome data.

RESULTS

Descriptive statistics

Among the 8107 cohort members, a total of 570 (7.0%) participants attended private school, and 308 (3.8%) participants attended grammar school (table 1). A total of 554 (7.2%) participants attended a higher-status university (online supplemental table S1). Participants with more advantageous childhood socioeconomic circumstances (higher parental education, occupation status and household income at age 10 years) and fewer school absences due to illness at age 10 years were more likely to attend private schools and higher-status universities. Higher cognitive scores at age 10 years were associated with higher attendance at both private and grammar schools (online supplemental figure S2).

High school type and health outcomes

Overall, private school attendance was associated with better health outcomes in most cardiometabolic and cognitive outcomes compared with comprehensive school attendance in sex-adjusted models (figure 1/online supplemental table S2). In sex-adjusted models, private school attendance had 0.32 (95% CI: 0.23 to 0.41) and 0.19 (0.10 to 0.27) better outcomes (lower z-scores) in BMI and systolic blood pressure, respectively. After full adjustment, these estimates have attenuated about 50% (BMI, 0.14, 0.04, 0.23; systolic blood pressure, 0.10, 0.01, 0.19). Private school attendees also performed better in the letter cancellation task (0.11, 0.02, 0.20) after full adjustment.

Grammar school attendance was also associated with better outcomes in BMI, pulse, eye-closed standing balance and most of the cognitive tasks compared with comprehensive school attendance in sex-adjusted models. However, most of these associations have attenuated after full adjustment, except for eye-closed standing balance (0.15, 0.02, 0.28). No major difference was found between grammar school and private school attendance, except for BMI in sex-adjusted model, where private school attendance was associated with better outcome in BMI (0.16, 0.01, 0.31; online supplemental table S3).

Qualification/university type and health outcomes

In sex-adjusted models, higher-status university attendance was associated with better outcomes/performance in BMI and most cognitive task (except for letter cancellation) compared with normal-status university attendance (figure 2/online supplemental table S4). After adjustment, the association with BMI has attenuated, while the associations with the three cognitive

Table 1 Descriptive characteristics of the study sample by high school type

Characteristics and outcome at 46 years old	N	High school attended (N/mean; %/SD)		
		Comprehensive and other	Grammar	Private
Full sample	8107	7229 (89.2%)	308 (3.8%)	570 (7.0%)
Male	3892	3430 (88.1%)	153 (3.9%)	309 (7.9%)**
Female	4215	3799 (90.1%)	155 (3.7%)	261 (6.2%)
Potential confounders				
Parental education: degree (10 years)	6602			
Yes	1146	852 (74.4%)	86 (7.5%)	208 (18.2%)**
No	5456	5084 (93.2%)	159 (2.9%)	213 (3.9%)
Parental occupational class (10 years)	6922			
I Professional	467	319 (68.3%)	34 (7.3%)	114 (24.4%)**
II Managerial and technical	1851	1540 (83.2%)	104 (5.6%)	207 (11.2%)
III Non-manual	799	707 (88.5%)	41 (5.1%)	51 (6.4%)
III Manual	2732	2622 (96.0%)	57 (2.1%)	53 (2.0%)
IV Partly skilled	848	813 (96.0%)	21 (2.4%)	14 (1.6%)
V Unskilled	225	221 (98.2%)	3 (1.3%)	1 (0.4%)
Weekly household income (10 years)	6569			
Under £35	95	90 (94.7%)	2 (2.1%)	3 (3.2%)**
£35–49	272	255 (93.8%)	13 (4.8%)	4 (1.5%)
£50–99	1794	1718 ((95.8%)	44 (2.5%)	32 (1.8%)
£100–149	2317	2183 (94.2%)	69 (3.0%)	65 (2.8%)
£150–199	1160	1048 (90.3%)	41 (3.5%)	71 (6.1%)
£200–249	478	372 (77.8%)	37 (7.7%)	69 (14.5%)
£250	453	265 (58.5%)	35 (7.7%)	153 (33.8%)
Reading score (10 years)	6042	41.7 (11.7)	51.3 (8.7)	50.8 (10.0)**
Maths score (10 years)	6041	45.3 (11.3)	55.0 (9.2)	54.5 (10.8)**
Spelling Dictation task (10 years)	6464	35.7 (10.1)	42.2 (7.1)	41.2 (8.0)**
Pictorial Language Comprehension (10 years)	6575	62.1 (10.11)	69.8 (9.5)	69.1 (10.5)**
British Ability Scales (10 years)	6010	61.1 (12.5)	72.2 (11.1)	71.4 (12.6)**
School missed due to illness (10 years)	7063			
Yes	2611	2400 (91.9%)	84 (3.2%)	127 (4.9%)**
No	4452	3952 (88.8%)	180 (4.0%)	320 (7.2%)
Presence of disability (10 years)	7077			
Yes	453	409 (90.2%)	12 (2.7%)	32 (7.1%)
No	6624	5958 (90.0%)	249 (3.8%)	417 (6.3%)
Outcomes				
Cardiometabolic				
Body mass index (kg/m^2)	7068	28.6 (5.5)	27.7 (5.4)	26.9 (4.8)**
Systolic blood pressure (mm Hg)	7180	124.2 (15.2)	123.6 (14.2)	122.0 (14.3)**
Pulse (beats per minute)	7178	68.4 (10.6)	66.7 (10.5)	66.3 (10.3)**
Physical function				
Grip strength (kg)	7146	38.0 (12.1)	38.6 (10.9)	39.5 (11.1)**
Standing balance: eyes opened (s)	7054	28.1 (5.8)	28.4 (5.6)	28.8 (4.9)*
Standing balance: eyes closed (s)	6118	11.6 (9.6)	14.2 (10.4)	14.3 (10.3)**
Cognitive function				
Immediate word recall	8052	6.6 (1.4)	7.1 (1.4)	7.2 (1.3)**
Animal naming	8047	23.5 (6.0)	26.0 (6.8)	26.2 (6.4)**
Letter cancellation speed	7822	345.5 (84.1)	351.6 (76.7)	361.6 (82.7)**
Delayed word recall	8046	5.4 (1.8)	6.2 (1.7)	6.1 (1.8)**

*p<0.05, **p<0.01, using χ^2 test or t-test across high school type.

tasks remained (immediate word recall, 0.16, 0.07, 0.26; animal naming, 0.10, 0.00, 0.19; delayed word recall, 0.14, 0.05, 0.24).

In sex-adjusted models, having no degree was associated with worse outcomes in most health measures compared with normal-status university attendance, except for grip strength (for both with no qualifications/GCSEs only and with A-levels/diplomas) and eyes-opened standing balance (A-levels/diplomas only). These associations remained after being fully adjusted.

Supplemental and sensitivity analyses

Supplementary results suggested that associations between education type and health outcomes were only partly explained

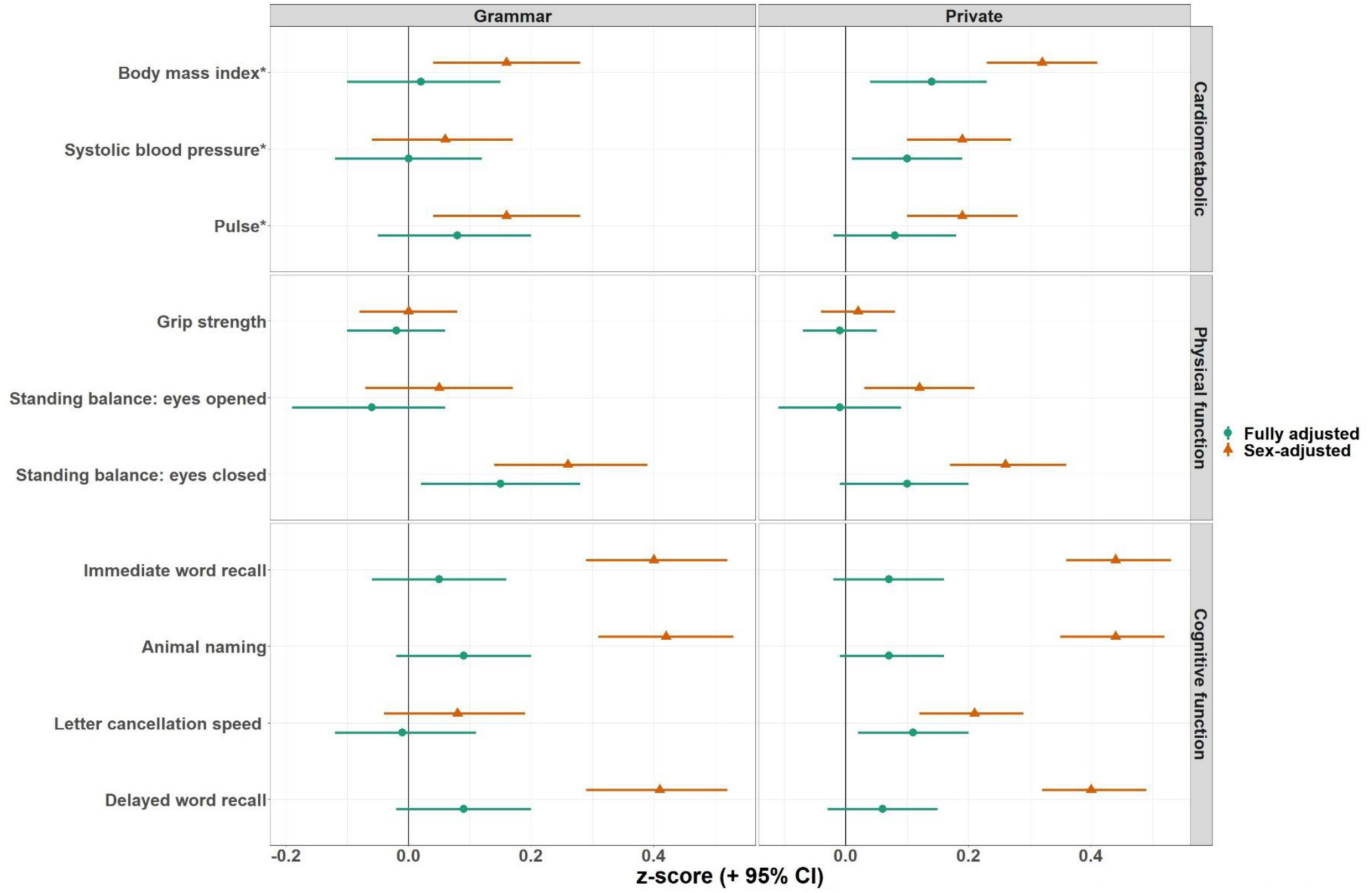

Figure 1 Associations between the type of high school attended and health outcomes at age 46 years, comprehensive/other as reference group. *Sign reversed, positive values indicate more favourable outcomes.

by cognitive ability at age 10 years; hence, some of the differences in association were also explained by childhood SEP and childhood health (online supplemental tables S5 and S6). Results were similar after further adjustment for cognitive ability at age 5 years (online supplemental tables S7 and S8) and home learning environment and parental educational aspirations (online supplemental tables S9 and S10). No major differences were found in complete case analyses (online supplemental tables S11 and S12).

DISCUSSION

Main findings

Overall, results from the sex-adjusted models indicate a favourable link between attending higher-status institutions and health at age 46 years in the BCS70 cohort. After accounting for various potential confounders, private school attendance was associated with better cardiometabolic outcomes than comprehensive school attendance. After being fully adjusted, attending higher-status universities was associated with better cognitive function, while having no degree was linked to poorer health compared with normal-status university attendance.

Comparison with previous findings

Previous British studies using the 1958 National Child Development Study or the Aberdeen Children of the 1950s birth cohort study have found a weak positive association between attending a selective school and self-rated health in later life.[19–21] These studies used the comprehensive reform in the UK as natural experiment, comparing those exposed to a selective or non-selective schooling system, which is equivalent to the distinction between grammar schools and comprehensive schools. An analysis of our data suggested that there was not a clear discontinuity which could be used in such a design (see online supplemental figure S2). Nevertheless, our findings also suggest that many beneficial associations between grammar school attendance and health have attenuated after full adjustment consistent with these studies. A previous study using the BCS70 cohort concluded that private school and high-status university attendance was associated with lower self-reported BMI.[22] Our analyses have extended this previous study by using objective outcome measures and also found consistent evidence for BMI.

Previous studies in the USA have found that attending an advantageous secondary school measured by indicators such as student-teacher ratio or a highly selective university was associated with better cognitive function in old age.[16 17] This is consistent with our finding that higher-status university attendance was associated with better performance in cognitive tasks. However, the comparability of these results to our study remains unclear. These studies have used different measures of education type (either by college selectivity or an aggregate measure of school-level structural advantage indicated by factors such as spending per pupil), adjusted preceding cognitive ability by either polygenic scores for general cognitive ability or previous standardised test score, and have focused on cognitive outcomes in old age.

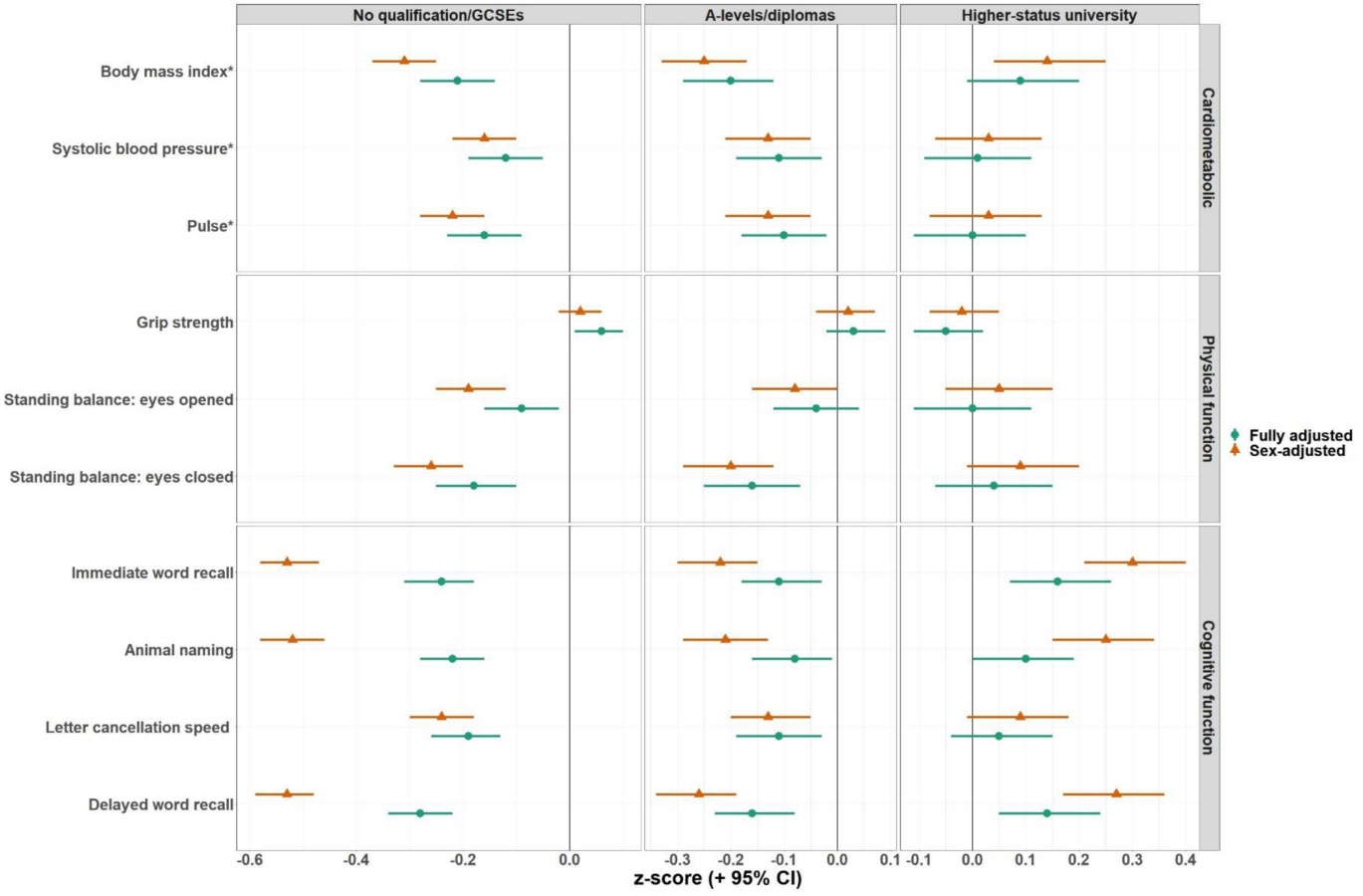

Figure 2 Associations between type of qualification/university attended and health outcomes at age 46 years, normal-status university as reference group. *Sign reversed, positive values indicated more favourable outcomes.

Explanation of findings

Several potential mechanisms may explain the beneficial associations between higher-status education and subsequent health; provided that the exposure-outcome associations are causal, these warrant investigation. At the high school level, attending private schools was associated with lower BMI and systolic blood pressure at age 46 years. Private schools can promote healthier health-related behaviours among their attendees. Peers at private schools tend to display different health behaviours such as greater physical activity,[12 13] which can influence attendees' behaviours through peer effect.[14 15] Research using data from the previous wave of BCS70 has supported this suggestion, finding higher-status institution attendance to be related to better health-related behaviours at age 42 years.[22] This might partly contribute to the beneficial associations found between private school attendance and health in this study. Apart from behaviour factors, private school attendance is often associated with higher subsequent SEPs.[8] This can favourably be associated with BMI and blood pressure, either directly by increasing the affordability of healthy diet/activity or indirectly through better social connections and neighbourhood environment.[38] Finally, our results could be explained by confounding; while we accounted for multiple potential prospectively ascertained confounders, the available measures may have imperfectly captured the relevant constructs, leading to residual confounding. We anticipate that this could have been an issue for cognitive ability since some (but not all) private schools required tests to attend and, for parental SEP, since disposable income and wealth transfers could have influenced attendance. Conversely, however, the inclusion of multiple measures of childhood cognitive function may have biased results as cognitive ability is likely to be related to educational resources and quality even within the categories defined by our exposure variables—for example, within private schools or Russell Group universities. In other words, cognitive ability may capture the latent constructs (school resourcing or quality) more accurately than the categorical exposures (school type) used.

At the university level, higher-status university attendance was found to be associated with better cognitive function after full adjustment; associations with other outcomes were largely attenuated after adjustment. This contrasts with findings for the lowest education group, in which associations with outcomes remained after adjustment. The distinction in factors associated with health such as subsequent SEP may be greater between participants with and without a degree than between participants attending different university types. In our study sample, 7.2% of the participants attended a high-status university; while this is a similar fraction of those who attended private schools, the composition of the group likely differs in ways which linked with subsequent health. The persisting links with cognition outcomes likely partly reflect the selection into higher-status institutions (confounding due to cognition). It could also partly reflect causal effects on cognition,[39] due, for example, to the enhanced pathways of cognitively stimulating environments that higher subsequent SEP affords (eg, higher-status occupations enabled by higher-status institutions attended). Future studies could compare the subject of degrees undertaken in university to investigate the mediating potential role of subsequent SEP, as the

economic returns to higher education markedly differ by degree undertaken.[40]

Strengths and limitations

The strengths of this study include the usage of a large, nationally representative study cohort with detailed information on high school/qualification type, multiple health outcomes in middle age and a range of childhood socioeconomic, health and cognitive measures. The health outcomes investigated were measured objectively during a nurse visit.[27] This reduces potential reporting bias using self-reported health measures, as health reporting tends to differ according to education attainment.[23] Moreover, multiple health outcomes were investigated simultaneously. This enables different aspects of health to be investigated, which enables the education-health association to be better understood given its potentially heterogeneous nature.

Our study has several limitations. In nurse visits, cohort members were first invited to perform the eye-opened standing balance, and only those who reached 30 s were further invited to perform the eye-closed task.[27] Therefore, results of eye-closed standing balance were based on a more selective group which might explain the different results found between the two standing balance tasks. Also, as discussed previously, results from this study may be subject to residual confounding. Potential confounders such as childhood SEP and cognitive function are difficult to capture comprehensively, and factors such as parents' level of motivation regarding education were unobserved. Therefore, residual confounding may exist, and the causal nature of the relationship is difficult to establish. Future studies could use other designs such as quasi-experimental approaches, where exogenous variation in educational access can be identified.

Finally, this study investigated the effects of higher-status institution attendance in one particular generation in the UK. The generalisability of the results to the present day remains unclear, especially given the changes in the education system in recent years. This cohort underwent schooling in the 1980s and 1990s amidst significant reforms in the UK education system, with these reforms aimed to introduce marketisation and privatisation, and promotion of quality, diversity, parental choice and autonomy in schools.[41] With the changing school fees, economic returns and motivation of choosing such institutions,[9 42 43] results may differ in other cohorts and contexts. At the high school level, a significant rise in both school fees and labour market returns to private education was observed in recent decades[9 43]; if pathways linking elite education and health operate through labour market returns, the relative importance of elite education for health may have increased. There has also been a rapid expansion of higher education attendance in recent years, with evidence suggesting improving access to higher education among socially disadvantaged individuals.[44] In this context, education-related variables which capture the type, status or resources of the institution attended may be increasingly important in capturing information which is relevant to both SEP and health.

Potential implications

Our findings suggest that the type of education could potentially contribute to understanding links between education and health. Previous studies investigating the effects of education on health have predominantly focused on educational attainment.[1 2 4 5] As the type of education was uncaptured, the total effects of education on health could have been underestimated. Moreover, if this association is causal, future policies aimed at reducing health inequalities could take education quality into account as well as attainment. This is particularly important given the increases in university attendance, in which other aspects of the education experience may better distinguish health inequality.

CONCLUSION

We found that higher-status institution attendance was associated with better subsequent health in mid-adulthood, using multiple objective health measures. The type of education might be a factor contributing to the education-health relationship. Further research is warranted to test the causal nature of this relationship, mediating pathways and its generalisability to more recently born cohorts given changes in secondary education and the expansion of higher education.

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Contributors Wrote the first draft and conducted statistical analysis: KD. Contributed to the analytical strategy, interpretation of data and revising the manuscript: all authors. KD is the guarantor of the work.

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Competing interests None declared.

Patient consent for publication Not applicable.

Ethics approval This study involved human participants, and the ethics approval of the 1970 British Cohort Study was obtained from a National Health Service Research Ethics Committee in advance of each sweep of data collection. The Age 46 Survey used in this study was approved by South East Coast—Brighton and Sussex (15/LO/1446). Participants gave informed consent to participate in the study before taking part.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement Data are available in a public, open access repository. Data from the 1970 British Cohort Study are available from the UK Data Service (https://beta.ukdataservice.ac.uk/datacatalogue/series/series?id=200001).

ORCID iDs
Keyao Deng http://orcid.org/0000-0002-1211-5783
David Bann http://orcid.org/0000-0002-6454-626X

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