

Higher education attainment does not improve the adult employment outcomes of adolescents with ill health

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Abstract

This paper assesses whether attaining a higher education improves the chances of employment in adulthood amongst those who had a chronic health condition in adolescence. Using longitudinal analysis of twelve waves of the nationally representative Household Income and Labour Dynamics in Australia Survey, conducted between 2001 and 2012, a cohort of adolescents aged 15 to 21 in Wave 1 were followed through to age 24 ($n=624$). The results show that those who did have a chronic health condition during adolescence were 2.4 times more likely to not be employed at age 24 compared to those who did not have a chronic health condition (95% CI: 1.4 – 4.4, $p=0.0024$). The results were adjusted for age, sex, education attainment at age 24, health status at age 24 and household income poverty status at age 24. Amongst those who did have a chronic health condition during adolescence there was no significant difference in the likelihood of being employed for those with a Year 12 and below ($p=0.1087$) level of education attainment or those with a Diploma, Certificate III or IV ($p=0.6366$) compared to those with a university degree. Education attainment was not shown to mitigate the impact of having a chronic health condition during adolescence on adult employment outcomes.

Keywords: employment; chronic health conditions; poverty; living standards; longitudinal.

Numerous studies have documented the association between health and labour force participation (Bartel & Taubman, 1979; Cai, 2007; Cai & Kalb, 2004; Campolieti, 2002; Kraut, Walld, Tate, & Mustard, 2001; Pandey, 2009; Roberts, Rice, & Jones, 2008; Stern, 1989). For example, Nepal, Payne and Brown (2009) found that one in two working aged Australians with poor health were not in the labour force, compared to one in five of those with good health. While these studies are predominantly cross-sectional in nature and examine current health status, there is a small but growing body of literature, predominantly from the United States and the United Kingdom, that identifies the detrimental impact childhood ill health has on adult labour force participation (Case, Fertig, & Paxson, 2005; Case & Paxson, 2010; Goodman, Joyce, & Smith, 2011; Smith, 2009; Smith & Smith, 2010). A recent systematic review has documented the negative influence poor health has on the employment of younger people (Hale, Bevilacqua, & Viner, 2015). Given the known economic consequences of labour force exit in virtually all Organisation for Economic Co-operation and Development (OECD)

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countries (Organisation for Economic Co-operation and Development, 2007), childhood poor health has the potential to detrimentally impact upon individuals for the rest of their lives. However, the impediment of chronic disease may be offset by a higher education. Higher levels of education attainment are known to be strongly linked with better chances of labour force participation within Australia (Laplagne, Glover, & Shomos, 2007; OECD, 2006; Productivity Commission, 2005). Education has long been considered to be a key form of human capital (Schultz, 1962). Within Australia, education has been specifically identified as giving disadvantaged individuals the ability to participate in the labour force (Council of Australian Governments, 2006).

This paper has two aims, firstly to determine whether those who suffered a chronic health condition during adolescence had lower rates of employment in adulthood after taking into consideration tertiary education attainment. The second aim sought to compare the adult employment outcomes of those who achieved different levels of education attainment amongst those who suffered a chronic health condition during adolescence. Given the documented influence of education attainment on labour force participation it is expected that after taking into consideration tertiary education attainment there will be little difference in adult employment outcomes between those who did experience a chronic health condition during adolescence and those that did not; and that those with a tertiary level of education attainment amongst those who experienced poor health during adolescence will have better employment outcomes than those with lower levels of education attainment.

Method

Data set sampling and weighting

This was a longitudinal study, which utilised the Household Income and Labour Dynamics in Australia (HILDA) Survey to assess changes in education, health and employment in the Australian population aged 15 to 21 years in 2001 up until the time they turned 24. The HILDA survey is a longitudinal survey of private Australian households conducted annually since 2001. The data was nationally representative of the Australian population living in private dwellings and aged 15 years and over (Summerfield et al., 2010). The survey sampling unit for Wave 1 was the household, with all individual members of the selected households followed over the life of the survey, however, only those aged 15 and over had detailed individual information recorded. Households are generally used as the sampling unit for panel datasets concerned with eliciting information at both the individual and household level (Lynn, 2009). The reference population for the HILDA sample selection was all members of private dwellings in Australia, except overseas residents, including diplomatic personnel, in Australia; residents of institutions such as hospitals, military and police barracks, correctional institutions and monasteries and non-private dwellings such as hotels; and people living in very remote sparsely populated areas. Household sampling was conducted in a three-stage approach. This coverage broadly aligns with that used by the Australian Bureau of Statistics, for labour force participation measurements (Australian Bureau of Statistics, 2001). Initially 488 Census Collection Districts (each containing 200 to 250 households) from across Australia were randomly selected. Then within each of these districts, 22 to 34 dwellings were randomly selected. Finally, up to three households within each dwelling were randomly selected to be part of the sample.

The initial household cross-sectional weights in Wave 1 (upon which the cross-sectional weights in subsequent waves are dependent) were derived from the probability of selecting the household and were calibrated so that the weighted estimates matched known benchmarks for number of adults by number of children and state by part of state. The person-level weights were based on the household weights and then calibrated so that person weights matched known benchmarks for sex by age, state by part of state, state by labour force status, marital status and household composition. Longitudinal weights adjusted

for attrition and benchmarked against the characteristics of Wave 1. For a detailed description of HILDA weighting see Watson (2012).

Study design

Individuals who were aged between 15 and 21 in Wave 1 (2001) of the HILDA dataset were identified. These individuals were then followed through the later waves until the age of 21, and those who had a chronic health condition at any time in this time period were identified. These people were referred to as 'those who experienced a chronic health condition during adolescence'. A chronic health condition in the HILDA dataset was defined as "any long-term health condition, impairment or disability that restricts everyday activities, and has lasted or is likely to last, for 6 months or more" (HILDA Project Director Melbourne Institute of Applied Economic and Social Research, 2012). For individuals who were aged 15 in Wave 1, their chronic health condition status was assessed in each wave between Wave 1 and Wave 7 (the year they turned 21); for individuals who were aged 16 in Wave 1, their chronic health condition status was assessed in each wave between Wave 1 and Wave 6; and so on until for individuals who were aged 21 in Wave 1, their chronic health condition status in Wave 1 only was assessed. This is detailed in Table 1.

Table 1: Wave and year that respondents of various ages in HILDA Wave 1 were 21 and 24 years of age

Age in Wave 1 (2001)	Wave and Year respondent was age 21	Wave and Year respondent was age 24
15	Wave 7 (2007)	Wave 10 (2010)
16	Wave 6 (2006)	Wave 9 (2009)
17	Wave 5 (2005)	Wave 8 (2008)
18	Wave 4 (2004)	Wave 7 (2007)
19	Wave 3 (2003)	Wave 6 (2006)
20	Wave 2 (2002)	Wave 5 (2005)
21	Wave 1 (2001)	Wave 4 (2004)

Highest level of education attainment at age 24 was then identified for the individuals who were aged between 15 and 21 in Wave 1. Education attainment was grouped into three categories: 1) University degree (postgraduate degree, bachelor degree); 2) Diploma, Certificate III or Certificate IV (post High School, but not University); and 3) Year 12 and Year 11 or below. Individuals were identified as being either employed (in full time or part time employment) or not employed (unemployed but looking for full time or part time work, or not in the labour force) at age 24.

Statistical analysis

Descriptive analysis was initially undertaken, comparing the number and proportion of people who at age 24 had different levels of highest education attainment, overall health

status at age 24¹, and were in households who were in income poverty at age 24², for those who had a chronic health condition during adolescence and those that did not.

A logistic regression model was constructed to assess the odds ratio of having a tertiary degree as the highest level of education attainment at age 24 for those who had a chronic health condition during adolescence, compared to those who did not. Those who did not have a chronic health condition during adolescence were used as the reference group, and the models were adjusted for age in Wave 1, and sex.

Employment status at age 24 was then assessed. A logistic regression model was built to compare the odds of not being employed at age 24 for those who had and did not have a chronic health condition during adolescence. The model was adjusted for age in Wave 1, sex, health status at age 24, and household income poverty status at age 24. People who had a health condition during adolescence were used as a reference group. The logistic regression model was then repeated with the addition of highest level of education attainment at age 24 as a confounding variable.

The analysis was then limited to those who had a chronic health condition during adolescence. A logistic regression model was built to compare the odds of being employed at age 24 for those who had a university degree, a Diploma, Certificate IV or III, and Year 12 or Year 11 and below. The model was adjusted for age in Wave 1, sex, health status at age 24, and household income poverty status at age 24. People whose highest level of education attainment was Year 12 or Year 11 and below were used as the reference group.

The analysis was undertaken on weighted data. The HILDA survey contained longitudinal weights, which ensure that records were representative of the Australian population. All analysis was conducted using SAS V9.2 (SAS, 2016). Statistical significance was set at a 5% level.

Results

Adult outcomes of those with a chronic health condition in adolescence

There were 624 records of people who were aged 15 to 21 years at their last birthday as of 30 June 2001, on the HILDA Wave 1 dataset. These records represented 1,588,800 individuals within the Australian population in 2001. Of this group, 406,000 people (or 26% of this population) had a chronic health condition between the age of 15 and 21.

Of the people who had a chronic health condition during adolescence, 48% had poor overall health status and 10% were in income poverty at age 24. Whereas 33% of people who did not have a chronic health condition during adolescence reported having poor overall health status at age 24, and 4% were in income poverty.

Table 2 compares the highest level of education attainment at age 24 for the population of individuals who were aged 15 to 21 in 2001. A lower proportion of people who experienced a chronic health condition during adolescence had a university degree, compared with those who did not experience a chronic health condition. A higher proportion of those who had a

¹ Health status at age 24 was measured using the SF-36 health scale (IQOLA, 2009) and the SF-6D (SF-36) health utility score (Brazier, Harper, & Deverill, 2002), which was recorded on the HILDA dataset. The cut-off point for being disadvantaged in the dimension of health was having a health utility score lower than the average score for one's age group (Callander, Schofield, Shrestha, & Kelly, 2012; Utah Department of Health, 2001).

² People's household income poverty status at age 24 was identified utilizing OECD-modified equivalence scales and the 50% of the median income poverty line, as is standard practice in Australia (see for example Saunders & Bradbury, 2006; Saunders, Hill, & Bradbury, 2007). This takes into consideration the income of each member of the household in assessing income poverty status. People whose equivalised household income fell below 50% of the median income for the population in the year the person was 24 were deemed to be in income poverty at age 24.

chronic health condition in adolescence had Year 12, or Year 11 and below as their highest level of education attainment. After adjusting for age and sex those who had a chronic health condition during adolescence had 0.3 times the odds of having a university degree at age 24 than those who did not experience a chronic health condition (95% CI: 0.2 – 0.5, $p < .0001$).

Table 2: Highest level of education attainment at age 24 amongst individuals who were aged 15 to 21 in 2001

Health status during adolescence		Highest level of education attainment at age 24			Total
		University degree	Diploma, Cert III/IV	Year 12, Year 11 or below	
Did not have a chronic health condition in adolescence	Sample (n)	146	117	201	464
	Population (N)	378 000	293 700	511 200	1 182 800
	% of population	32%	25%	43%	100%
Had a chronic health condition in adolescence	Sample (n)	21	48	91	160
	Population (N)	52 000	135 500	218 500	406 000
	% of population	13%	33%	54%	100%

Employment outcomes and education attainment

74% of those who had a chronic health condition during adolescence were employed at age 24 and 26% were not employed. 91% of those who did not experience a chronic health condition during adolescence were employed at age 24, and 9% were not employed. Before adjusting for highest level of education attainment, those who had a chronic health condition had 2.8 times the odds of not being employed at age 24 than those without a chronic health condition (95% CI: 1.5 – 5.1, $p = 0.0008$). This was adjusted for age in Wave 1, sex, health status at age 24 and household income poverty status at age 24. After adding highest level of education attainment to the model, those who had a chronic health condition had 2.4 times the odds of not being employed at age 24 than those without a chronic health condition (95% CI: 1.4 – 4.4, $p = 0.0024$). This was adjusted for age in Wave 1, sex, highest level of education attainment at age 24, health status at age 24 and household income poverty status at age 24.

The analysis was then limited to those who had a chronic health condition during adolescence. Table 3 shows the odds ratio of being employed at age 24 for those with different levels of education attainment, controlling for age, sex, health status and household income poverty status at age 24. There was no significant difference in the likelihood of being employed for those with a Year 12, or Year 11 and below level of education attainment or those with a Diploma, Certificate III or IV compared those with a university degree.

Table 3: Odds ratio of being employed (either full time or part time) at age 24, amongst individuals aged 15 to 21 in 2001 who had a chronic health condition during adolescence.

Highest level of education attainment at age 24	Sample (n)	Population (N)	Proportion of population employed	OR of being employed ^a	95% CI	p-value
University degree	21	52 000	87%		REFERENCE	
Diploma, Certificate III or IV	48	135 500	85%	0.6	0.1 – 5.0	0.6366
Year 12, Year 11 or below	91	218 500	65%	0.2	0.0 – 1.5	0.1087

^a Adjusted for age, sex, health status at age 24 and household income poverty status at age 24

Discussion

This study has shown that even after controlling for highest level of education attainment, those who had a chronic health condition during adolescence still had a lower likelihood of being employed at age 24. For people who experienced a chronic health condition during adolescence, having a University degree did not improve the chances of employment. This is the first study to document whether or not education attainment can mitigate the negative impact of chronic health conditions on the labour force participation of young people. Other studies have identified that those who experience poor health during adolescence have lower rates of employment during adulthood (Case et al., 2005; Case & Paxson, 2010; Currie & Stabile, 2004; Currie, Stabile, Manivong, & Roos, 2008; Goodman et al., 2011; Haas, 2006; Haas & Fosse, 2008; Hack et al., 2002; Jackson, 2009; Smith, 2009; Smith & Smith, 2010). However, other studies have not explored if education attainment may mitigate these impacts. This is a significant omission given that policies to improve the lives of disadvantaged children and improve their labour force participation are usually based upon improving education attainment (COAG Reform Council, 2009: xv; Social Inclusion Group, 2011; Social Inclusion Unit, 2009).

While education is often cited as a means of improving the lives of disadvantaged children, little attention has been given to childhood chronic health conditions in policies to improve living standards of children. This study has shown that of the cohort of adolescents aged 15 to 21 in 2001, 26% experienced a chronic health condition between 2001 and the time they turned 21. The study has also shown that only 74% of these people were employed when they were 24, compared to 91% of the people who did not experience a chronic health condition. Furthermore, after controlling for level of highest education attainment and adult health status, those who did not experience a health condition during adolescence were still more than twice as likely to be employed by comparison. This may have particular significance at a time when youth unemployment rates across Australia are relatively high (Australian Bureau of Statistics, 2016) and governments are giving significant attention to improving the employment rates of young Australians (Australian Government, 2015).

Labour force participation is of significant importance for long-term health and wellbeing, hence the importance of measuring and identifying what influences labour force participation of young people. Unemployment is adversely associated with people's health, particularly their mental health (Hammarström & Janlert, 2002; Marmont, 2005; Paul & Moser, 2009;

Viner et al., 2012), as is non-stable employment (Keuskamp, Ziersch, Baum, & LaMontagne, 2013). Furthermore, labour force participation is an important means of social interaction for people with poor health (Callander & Schofield, 2013), which in turn has documented health benefits (Bloom, Stewart, Johnston, Banks, & Fobair, 2001; Byggen, Konlaan, & Johansson, 1996; Glass, Mendes de Leon, Martottoli, & Berkman, 1999; House, Robbins, & Metzer, 1982; Kaplan et al., 1988; Lynch et al., 2008; Orth-Gomer, Rosengren, & Wilhelmsen, 1993; Uchino, Cacioppo, & Kiecolt-Glaser, 1996). People who had a chronic health condition during childhood may have their long term health further adversely affected through poorer socioeconomic circumstances as a result of their lower rates of workforce participation.

Assisting young people with chronic health conditions to enter the labour force should be seen as a priority when seeking to address youth unemployment. However, this paper has shown that gaining a tertiary level of education attainment made little difference to the likelihood of young people with a chronic health condition participating in the workforce. Given this, policies to prevent and manage chronic health conditions during adolescence require more weighting, in the way that policies to improve education attainment have been prioritized if the aims is to advance the living standards of disadvantaged children.

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