



Housing tenure and affordability and mental health following disability acquisition in adulthood

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ABSTRACT

Acquiring a disability in adulthood is associated with a reduction in mental health and access to secure and affordable housing is associated with better mental health. We hypothesised that the association between acquisition of disability and mental health is modified by housing tenure and affordability. We used twelve annual waves of data (2001–2012) (1913 participants, 13,037 observations) from the Household, Income and Labour Dynamics in Australia survey. Eligible participants reported at least two consecutive waves of disability preceded by two consecutive waves without disability. Effect measure modification, on the additive scale, was tested in three fixed-effects linear regression models (which remove time-invariant confounding) which included a cross-product term between disability and prior housing circumstances: housing tenure by disability; housing affordability by disability and, in a subsample (896 participants 5913 observations) with housing costs, tenure/affordability by disability. The outcome was the continuous mental component summary (MCS) of SF-36. Models adjusted for time-varying confounders. There was statistical evidence that prior housing modified the effect of disability acquisition on mental health. Our findings suggested that those in affordable housing had a –1.7 point deterioration in MCS (95% CI –2.1, –1.3) following disability acquisition and those in unaffordable housing had a –4.2 point reduction (95% CI –5.2, –1.4). Among people with housing costs, the largest declines in MCS were for people with unaffordable mortgages (–5.3, 95% CI –8.8, –1.9) and private renters in unaffordable housing (–4.0, 95% CI –6.3, –1.6), compared to a –1.4 reduction (95% CI –2.1, –0.7) for mortgagors in affordable housing. In sum, we used causally-robust fixed-effects regression and showed that deterioration in mental health following disability acquisition is modified by prior housing circumstance with the largest negative associations found for those in unaffordable housing. Future research should test whether providing secure, affordable housing when people acquire a disability prevents deterioration in mental health.

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1. Introduction

Internationally, people with disabilities – nearly 20% of the population – experience significant socio-economic disadvantage (Kavanagh et al., 2014; Kavanagh et al., 2013; World Health

Organization and World Bank Group, 2011). Disabled Australians have lower rates of employment, post-secondary education, and incomes and are more likely to experience housing-related disadvantage compared to those without a disability (Beer et al., 2012; Beer and Faulkner, 2008; Beer et al., 2011; Kavanagh et al., 2014, 2013; Parker and Fisher, 2010). They are over-represented in Australia's housing welfare sector (Dalton and Ong, 2007), are more likely to experience homelessness (Beer et al., 2012; Beer and Faulkner, 2008) and unaffordable housing (Kavanagh et al., 2014, 2013) – a situation found in other high-income countries (Kyle

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and Dunn, 2008; Papworth Trust, 2011; Wang, 2005; White et al., 1994). People with disabilities have poorer physical and mental health and some authors have argued that their disadvantaged circumstances (including inadequate housing) may play a significant role in explaining these health inequalities although the evidence is primarily limited to adolescents and young adults (E. Emerson and Hatton, 2007; E. Emerson, Llewellyn, Honey and Kariuki, 2012; Honey et al., 2011). A study of older adults (65 years and older) found that for those who reported a disability at baseline, social support modified the relationship between disability and depressive symptoms (Yang, 2006). On average, mental health tends to decline after acquisition of disability (Mandemakers and Monden, 2010; Turner and Noh, 1988), however this is not universal (Eric Emerson, Kariuki, Honey and Llewellyn, 2014; Honey et al., 2011); one small Australian study found that social support and financial stability prior to onset of disability protected against deterioration in mental health in young adults (Honey et al., 2011). A study of over 2000 Australian adults found that although being in the highest tertile of wealth before disability acquisition was associated with a small deterioration in mental health the deterioration was larger for those in the lowest and mid tertile of wealth (Kavanagh et al., 2015). Similar findings were found in a UK study of adults where a greater reduction in subjective wellbeing was observed for people with below median wealth at time of disability acquisition (Smith et al., 2005). Elucidation of factors that predict deterioration in mental health with disability acquisition is of policy significance because it will enable better targeting of health and non-health sector interventions. Given housing's known relationship to health and its central role as a primary and regular household expenditure, it is an important potential modifier of the effect of disability acquisition on mental health – the focus of this paper.

1.1. Housing and health

Housing is an important social determinant of health (Braubach, 2011; Gibson et al., 2011; Shaw, 2004), characteristics which have been linked to health include dwelling quality, location, tenure and affordability. There is a strong evidence-base linking structural characteristics of housing (e.g. toxins, damp, accessibility) (Evans et al., 2000; Free et al., 2010) to health including for people with disabilities (Imrie, 2006). Australian housing stock is of relatively good quality and because the majority of Australians live around the climatically mild coast, the structural aspects of housing are less important. Tenure type is strongly related to health, with outright owners and mortgagors having better health than people living in private rental or public housing (Ellaway and Macintyre, 1998; Macintyre et al., 2003; Pollack et al., 2004); however, whether this relationship is causal has been debated (E. Baker, Bentley and Mason, 2013). In Australia, an association between housing tenure and mental health was not found in causally-robust fixed-effects longitudinal regression analyses (E. Baker et al., 2013). In the context of rapidly increasing house prices and increasing household debt relative to income (ABS, 2014), Australia currently has one of the most unaffordable housing markets in the world (Demographia, 2014), making housing affordability an increasingly important determinant of health. Two longitudinal studies in the United Kingdom and Australia have demonstrated deleterious associations between living in unaffordable housing and mental health independent of general financial hardship (R. Bentley, Baker, Mason, Subramanian and Kavanagh, 2011; Pevalin et al., 2008). However this relationship appears to be modified by tenure type with recent research suggesting that this association is stronger for private renters than home-owners in Australia (Mason et al., 2013; C. Pollack, Griffin and Lynch, 2010).

1.2. Disability acquisition and economic security

Acquiring a disability in adulthood may lead to concerns about future earnings due to difficulty maintaining employment or the need to reduce hours or move into lower-skilled jobs. Previous Australian research has shown that working-age adults who acquire a disability are more likely to become unemployed or under-employed (i.e. employed in jobs for which they are over-educated and over-skilled) (M. Jones, Mavromaras, Sloane and Wei, 2014; M. K. Jones and Sloane, 2010). In this situation housing tenure and affordability may be particularly salient as housing represents the largest category of household expenditure and assets for Australians (ABS, 2011, 2015).

1.3. Beyond 'average effects' of disability acquisition and mental health

As Bauer (2014) has argued, population health researchers tend to focus on single, or average effects (e.g. disability acquisition and mental health) rather than exploring how multiple positions, processes, and structural factors intersect to produce heterogeneous effects (Bauer, 2014). Given that people who acquire a disability may have reduced economic security it is conceivable that those with less financial and social resources may be particularly vulnerable to experiencing negative health consequences. As discussed earlier there is some evidence that social support, financial security and wealth may modify the association between disability acquisition and health (Honey et al., 2011; Smith et al., 2005). No previous studies have examined the whether housing circumstances prior to disability acquisition modify the association between acquisition and mental health. Housing tenure may provide a potential buffer against the mental health effects of acquiring a disability as housing assets may reduce concerns about threats to future income and tenure security. Similarly affordable housing may be important as even short-term reductions in income will make it difficult to meet housing costs with potential flow-through effects to mental health.

In this paper we investigate whether housing tenure and affordability are effect modifiers of the relationship between disability acquisition and mental health. We use data from a sample of 1913 people participating in the Household, Income and Labour Dynamics in Australia survey (HILDA) – a national population-based survey of Australian adults – who acquired a disability in adulthood. We conducted fixed-effects longitudinal regression analyses to account for time-invariant confounding and present estimates of effect measure modification (EMM) on the additive scale.

2. Methods

2.1. Conceptual model

Fig. 1 represents the Directed Acyclic Graph informing this analysis. DAGs visually the postulated causal relationships that are believed a priori to exist between the variables of interest to the research question using unidirectional arrows (Greenland et al., 1999; Williamson et al., 2014). Variables that have arrows leading both to the exposure and the outcome of interest represent prior common causes, or confounders. DAGs are invaluable in making the assumptions underlying statistical analyses explicit, and guiding the selection of variables for inclusion as confounders (Greenland et al., 1999) and mediators in statistical models. In our modified DAG, time-varying confounders include age, employment and occupation, and income. We represent the effect modifiers (the housing variables) by a unidirectional arrow to the pathway

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