



The effect of chronic pain on life satisfaction: Evidence from Australian data



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ABSTRACT

Chronic pain is associated with significant costs to individuals directly affected by this condition, their families, the healthcare system, and the society as a whole. This paper investigates the relationship between chronic pain and life satisfaction using a sample of around 90,000 observations from the first ten waves of the Household, Income and Labour Dynamics of Australia Survey (HILDA), which is a representative survey of the Australian population that started in 2000. We estimate the negative impact on life satisfaction and examine the persistence of the effect over multiple years. Chronic pain is associated with poor health conditions, disability, decreased participation in the labour market and lower quality of life. We calculate the compensating income variation of chronic pain, based on the measurement of chronic pain, the life satisfaction of individuals and the income of households. Panel data models with random and fixed effects are used to control for characteristics of individuals that do not vary over time. Further, we investigate whether individuals who experience chronic pain exhibit adaptation and recovery in life satisfaction after 3 years. Overall, we find that chronic pain has a large negative association with life satisfaction, and that the compensating income variation is substantial (around 640 US\$ per day).

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1. Introduction

Evaluation of the worth of new and existing health care interventions requires some knowledge regarding individuals' evaluations of their health improvements. Cost-effectiveness and cost-utility analyses help to compare different types of interventions in terms of their effectiveness and health-related quality of life but provide only limited information on the contribution to individuals' overall welfare.

One way to assess the welfare changes associated with health improvements is to analyse individuals' willingness to pay for specific interventions. However, there are difficulties in quantifying health-related benefits with this kind of methodology (Labelle and Hurley, 1992). In particular, existing methods for calculating willingness to pay are based on preference measurement, which can be done by observing individual behaviour and deducing preferences (revealed preferences) or by directly asking individuals to state their preferences (hypothetical preferences) (see for example

Chuck et al., 2009). However, both methods have their limitations, either because of potential sample selection (Heckman, 1979), or because individuals are asked to consider hypothetical situations of which they have no personal experience, which can mean responses may be subject to a variety of biases (Groot and Massen van den Brink, 2004).

To overcome some of these limitations, a different methodology, compensating income variation (CIV), has been developed and applied in the literature to value some of the consequences of a variety of health-problems, such as migraine (Groot and Massen van den Brink, 2004), cardio-vascular disease (Groot and Massen van den Brink, 2006), chronic disease (Ferrer-I-Carbonell & van Praag, 2002) informal care (Mentzakis et al., 2012), and disability (Oswald and Powdthavee, 2008), as well as to evaluate the effects of other major life events (see for example Clark and Oswald, 2002; Van Praag and Ferrer-I-Carbonell, 2004; Groot et al., 2007, and Carroll et al., 2009).

One of the potential uses of CIV is that, through estimation of monetary values for health states, direct comparison of the relative benefits and costs of alternative health care treatments or interventions in monetary terms becomes possible. Whilst it is

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recognised that, within health care, such comparison is often undertaken using estimates of cost per QALY in cost utility analysis, in some instances (e.g. where the cost per QALY value is highly uncertain, or covers a range that makes policy recommendations more challenging) an indication of the monetary value of a health condition may provide decision-makers with additional information to help inform a policy recommendation. More widely however, there may be concern that the benefits from some health care interventions, when measured in terms of “natural units” such as cure rates or valued using QALYs, may be undercounted in situations where health care treatments affect wider aspects of a person’s life.

In the health applications, individual life satisfaction is estimated as a function of various individual characteristics, such as household income, health and other factors affecting welfare, such as marital status and education. The results from the estimation are used to calculate an income-health trade off, keeping life satisfaction constant. This trade off, or compensating income variation, represents the monetary compensation needed by an individual with a particular health problem to have the same level of life satisfaction of an individual without the same health problem. Whilst the literature in this field suggests that it is feasible to produce valuations, a question remains however over the validity of the estimates generated. In particular, estimates can be unstable when different model specifications are used (Groot and Massen van den Brink, 2004). Moreover, a somewhat neglected feature of the existing studies is that they make little attempt to capture explicitly the influence of health dynamics, such as adaptation. This is important as life satisfaction levels for people with chronic conditions might be expected to change over time due to a re-framing of the problem, that is, over time, people adapt to their condition (a phenomenon also called ‘habituation’ or ‘response shift’ (Galenkamp et al., 2012)). Also, it is possible that different people exhibit different tendencies to adapt to changes in health, for example, the response to chronic disease may differ between men and women, as demonstrated by Hasmi and Davis (2009), who find that women demonstrate more adaptation to some forms of pain. More generally, much work in psychology shows that happiness levels bounce back after a negative life shock (Oswald and Powdthavee, 2008), although Easterlin (2005) observes that there are different levels of habituation across different domains in life, with more adaptation found in pecuniary rather than non-pecuniary domains.

In the health context, if adaptation is present and leads to additional changes in life satisfaction over and above those that can be attributed to changes in health, and if such adaptation is more prevalent in particular population groups, then knowledge of the magnitude of the effect is important in the generation of estimates of compensating income variation.

We address these issues by considering the condition of chronic pain. This is defined as “pain that persists past the normal time of healing” (Merskey and Bogduk, 1994, p. xi) or as pain that has lasted longer than three to six months (Debono et al., 2013). Chronic pain is considered here as it is associated with large increased health care costs, productivity costs and negative welfare consequences for the individual, their family and society as a whole (Philips, 2009; Christensen et al., 2011; Philips and Harper, 2011). Costs are large in part because many people are affected, for example, the Institute of Medicine of the National Academies Report (2011) indicates that chronic pain affects around one-half of all adult Americans, whilst in Australia, it is suggested that approximately 30% of Australians are affected (Pfizer Health report, 2011). For Australia, the total cost of pain is estimated at A\$34.2 (US\$30) billion in 2007, or A\$10,847 (US\$9546) for each person with chronic pain (Access Economics, 2007). Productivity

costs form the largest share of total costs, with pain playing a central role in individuals’ dynamics of employment and being a key determinant of self-reported work disability (Kapteyn et al., 2008). People with persistent pain are more than twice as likely to have difficulty working (Schofield et al., 2012) or to lose hours of productive time at work (Stewart et al., 2003).

Chronic pain is also well-suited to examine the influence of adaptation on life satisfaction in general and measures of compensating income variation in particular. Measures of subjective well-being such as questions on life satisfaction have been widely used in social sciences and psychology, as well as in some economic studies (see for example Clark and Oswald, 1994; Frey and Stutzer, 2000; Winkelmann, 2005). A problem with these measures is that individuals’ responses to these questions are related to individual personality characteristics that are unobserved or unmeasured, and this may lead different individuals to attach a different meaning to the definition of terms such as “totally satisfied with your life”. This is compounded by a condition such as chronic pain, where adaptation to the condition is possible. Indeed, the bedrock of “treatment” in chronic pain is the development of self-management approaches, many of which are based on cognitive behavioural therapy (CBT). Such therapeutic approaches encourage adaptation through the development of positive thoughts, feelings and attitudes towards adverse circumstances.

The objective of this paper therefore is to analyse the relationship between chronic pain and life satisfaction of adult individuals, using data from the Household, Income and Labour Dynamics in Australia (HILDA) Survey. We examine whether the impact of chronic pain on life satisfaction is lessened over time through adaptation, and assess the consequences of adaptation for estimates of compensating variation.

The rest of this paper is organized as follows. Section 2 describes the data and briefly presents pain and well-being indicators. Section 3 discusses the estimation methods and Section 4 presents the main results. Section 5 concludes.

2. Data

This paper uses data from ten waves of the HILDA Survey, which is a representative longitudinal study of the Australian population that started in 2000. A total of 13,969 individuals in 7682 households were interviewed in wave 1 through a combination of face-to-face interviews and self-completion questionnaires, for all members of households aged 15 years old and over (Wooden and Watson, 2002). HILDA is an indefinite life panel survey with a strong focus on family formation, income and work. All members of the households interviewed in wave 1 form the basis of the sample and they were interviewed in each subsequent wave. The sample has then been extended and now includes any new household members resulting from changes in the composition of the original households. In this study, we conduct secondary analysis on a non-identifiable dataset and therefore did not need to seek ethics approval. HILDA includes two different measures of pain. First, starting at wave 3, at each wave, individuals are asked whether they have any long term health conditions, with chronic pain as one of the possible alternatives that can be selected. Second, respondents are asked about the amount of bodily pain they had in the last 4 weeks and they can select one of the following alternatives: no pain at all; very mild; mild; moderate; severe; very severe. The focus of our paper is on chronic pain and therefore we decided to use the first indicator as our main variable of interest. Sensitivity tests have been run using the responses about bodily pain in the last 4 weeks and results are very similar.

Respondents are asked to report their life satisfaction at each wave in HILDA. They answer the following question: How satisfied

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