



Educational achievement and traits emotional stability and agreeableness as predictors of the occurrence of backache in adulthood



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ABSTRACT

This study investigated the associations between psychological as well as social factors in childhood and adulthood and the occurrence of adulthood back pain in a longitudinal birth cohort study. The analytic sample comprises 5698 participants with complete data on parental social class at birth, childhood cognitive ability tests scores at age 11, educational qualifications obtained at age 33, personality traits assessed at age 50, occupational levels, and back pain measured at age 55. Using hierarchical logistic regression analysis, results showed that among all socio-demographic and psychological factors examined, only the highest educational qualification (OR = 0.62: 0.41–0.93, $p < 0.05$) and traits emotional stability (OR = 0.76: 0.71–0.83, $p < 0.001$) and agreeableness (OR = 1.10: 1.01–1.21, $p < 0.05$) were significant predictors of the occurrence of back pain in adulthood. No significant sex differences were found for the prevalence of back pain in adulthood.

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1. Introduction

Back pain, especially low back pain, is a common public health problem among population and a major cause of disability that affects work performances and well-being (Duthey, 2013; Hoy, March, Brooks, Woolf, Blyth, Vos, & Buchbinder, 2010; Maniadakis and Gray, 2000), affecting about 80–85% of people over their lifetime (World Health Organisation, 2003). Back pain is among the top ten high burden diseases and injuries (Vos et al., 2013). However the causes of this health condition are unclear and only in approximately 5–15% low back pain can be attributed to a specific cause such as an osteoporotic fracture, neoplasm or infection (Andersson, 1999; Deyo & Weinstein, 2001; Hoy, Brooks, Blyth, & Buchbinder, 2010; Vos et al., 2013).

A number of studies have addressed the links between personality and back pain (Burton, Tillotson, Main, & Hollis, 1995; Hansen, Biering-Sørensen, & Schroll, 1995; Sjøgaard, 1987; Tavallaii, Kargar, Farzanegan, Saeidi, & Radfar, 2010; Wickström, Pentti, Hyytiäinen, & Uutela, 1989). Personality facets, coping strategies, and emotional problems have been used to assess the onset and occurrence of back pain (Bru, Mykletun, & Svebak, 1993; Cvijetic et al., 2014; Gilchrist, 1983; Guimond & Massrieh, 2012; Oron & Reichenberg, 2003; Sjøgaard, 1987; Tavallaii et al., 2010; Wickström et al., 1989).

A 20-year follow-up study revealed a positive association between MMPI-scale elevations (specifically Hypochondriasis, Depression, and Hysteria scores) with the presence of lower back pain for the following and preceding decade (Hansen et al., 1995). Another study (Tavallaii et al., 2010) indicated that MMPI subscale scores on Hysteria and Hypochondriasis were significantly and positively correlated with increased pain levels for patients with chronic back pain.

Bru et al. (1993) investigated levels of neuroticism (measured by the EPQ-N) in back pain. They found that a great amount of the variance was explained by EPQ-N scores. In a more recent study, Cvijetic et al. (2014) also found that chronic back pain patients with higher levels of neuroticism (EPQ) were significantly more likely to report higher levels of disability and lower levels of functioning (indicated by the self-report Rolland-Morris Questionnaire) due to back pain.

Previous findings in the association between extraversion and back pain are not unequivocal. Some studies have shown that extraversion is associated with the higher propensity for back pain as these individuals are more active and liable to engage in behaviours that put their back at risk. For example, Oron and Reichenberg (2003) found that higher levels of extraversion (EPQ-E) were predictive of soldiers self-reporting musculoskeletal complaints to the general practitioner. Yet a recent study ($n = 100$, 50 men and 50 women in the age range of 13–82 years) Guimond and Massrieh (2012) revealed that extraversion and perceiving personality preferences (as measured by the Myers-Brigg Type Indicator; MBTI) have also been significantly correlated with body postures styles that reduce lumbar back pain, namely an

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ideal posture. Moreover, body postures that are associated with increased pain (a sway-back posture) were significantly correlated with introverted personality types. However, most of the previous study in the area used small clinical samples.

Type-A personality behaviours, known to be associated with heart attacks, have been related to elevated intra-muscular pressure (Sjøgaard, 1987), which can result in musculoskeletal pain. Wickström et al. (1989) reported correlations between Type-A personality behaviours, specifically competitiveness, and a higher rate of back pain. Hard-driving, competitive tendency may lead to excess labour, which may elevate intramuscular pressure, inflammation, and overexertion in muscular and soft tissue and/or spinal.

The link between social class and health is well documented (Marmot, 2007; Wilkinson & Pickett, 2006). In a recent study using a larger sample of 2231 young people in Finland, Lallukka et al. (2014) investigated whether childhood and adult socio-economic position and social mobility are associated with radiating and non-specific lower back pain and sciatica. They found that childhood socio-economic circumstances affect the risk of radiating lower back pain and sciatica in adulthood, and both childhood and own socio-economic position remained associated with radiating lower back pain and sciatica after adjustments (Lallukka et al., 2014).

The present study looks at social and psychological correlates of adult backache problems. It concentrates on the role of personality traits that may influence in the prevalence of backache in adulthood taking into account socio-demographic factors in childhood and adulthood. Comparing with previous studies in the area there are three advantages of the data used for the present study: It is a large, nationally representative sample; the personality measure used in the study is the Big Five personality factors with sound psychometric properties; and it contains both childhood and adulthood social and psychological factors.

1.1. Hypotheses

From the available data we set out to investigate the associations between parental social class, gender, childhood intelligence, education, occupation, the Big Five personality traits, and the occurrence of backache in adulthood. From the previous literature we predicted that higher education and social class participants with lower neuroticism scores would report less backache in adulthood.

2. Method

2.1. Sample

The National Child Development Study 1958 is a large-scale longitudinal study of the 17,415 individuals who were born in Great Britain in a week in March 1958 (Ferri, Bynner, & Wadsworth, 2003). There were nine follow ups. The latest data were collected when cohort members were at age 55 in 2013. The following analysis is based on data collected when the study participants were at birth, at ages 11, 33, 50, and 55 years. Children completed tests of cognitive ability at age 11 years (response = 87%). At age 33 years, cohort members provided information on educational qualifications. At age 50 years, participants completed a questionnaire on personality traits (response = 69%). At age 55, participants provided information on whether they suffered from back pain (response = 78%) since last interview five years earlier. Participants also provided information on current occupational levels (response = 79%). The analytic sample comprises 5698 cohort members (49.3% females) with complete data. Analysis of response bias in the cohort data showed that the achieved adult samples did not differ from their target sample across a number of critical variables (social class, parental education and gender), despite a slight under-representation of the most disadvantaged groups (Fogelman, 1976). Bias due to attrition of the sample during childhood has been shown to be minimal (Plewis, Calderwood, Hawkes, & Nathan, 2004).

2.2. Measures

Childhood measures: Parental social class at birth was measured by the Registrar General's measure of social class (RGSC). RGSC is defined according to occupational status and the associated education, prestige or lifestyle (Marsh, 1986) and is assessed by the current or last held job. Where the father was absent, the social class (RGSC) of the mother was used. RGSC was coded on a six-point scale: I professional; II managerial/tech; IIIN skilled non-manual; IIIM skilled manual; IV semi-skilled; and V unskilled occupations (Leete & Fox, 1977). At birth mothers were interviewed and provided information on gestational age and birth weight. Childhood cognitive ability tests (Douglas, 1964) were accessed when cohort members were at age 11 consisting of 40 verbal and 40 non-verbal items and were administered at school. The standardized verbal and non-verbal test scores were combined and converted into British IQ scores with mean = 100 and SD = 15.

Adulthood measures: At age 33, participants were asked about their highest academic or vocational qualifications. Responses are coded to the six-point scale of National Vocational Qualifications levels (NVQ) which ranges from 'none' to 'university degree/higher'/equivalent NVQ 5 or 6. At age 50 years, personality traits were assessed by the 50 questions from the International Personality Item Pool (IPIP) (Goldberg, 1999). Responses (5-point, from "Strongly Agree" to "Strongly Disagree") are summed to provide scores on the 'Big-Five' personality traits: Extraversion, Emotionality/Neuroticism, Conscientiousness, Agreeableness, and Intellect/Openness. Z scores were used in the regression analysis. At age 55 years, data on current or last occupation held by cohort members were coded according to the RGSC, using a 6-point classification described above. In 2013, when cohort members were at age 55, the 9th follow up was carried out using computer assisted web interviewing (CAWI) and computer assisted telephone interviewing (CATI). The Age 55 survey adopted a sequential (CAWI, followed by CATI) mixed-mode design. It was the first time two different data collection modes had been offered as sequential alternatives in the same survey and was also the first time that online data collection was used. All cohort members in the mixed mode sample were asked to complete the questionnaire online. Non-responders (after five weeks and two reminder letters/emails) were contacted by telephone (where a telephone number was available) and asked to do a telephone interview instead. The survey took approximately 30 min to complete. In the interview, participants answered the question about whether they suffered back problems (recurrent backache/prolapsed disc/sciatica) since last interview held five years earlier with Yes/No response. In addition, participants also answered a question "Which of these types of back problem have you had since last interview five years prior to interview? Please select yes or no for each type of back problem" with four choices: 1. recurrent backache (78.6%); 2. prolapsed disc (18.6%); 3. sciatica (44.2%); 4. other back problem (29.1%). The response of general (non-specific) back pain was used as the outcome variable.

2.3. Statistical analyses

To investigate the prevalence of back pain in adulthood, we first examined the characteristics of the study population and sex difference in the occurrence of back pain using Chi-square Test. We then conducted the Spearman rank order correlation analysis on the measures used in the study. Following this we carried out a hierarchical logistic regression analysis using STATA version 14. Two models were designed. In Step 1, the model examined childhood factors in influencing the occurrence of back pain in adulthood; and in Step 2, the model examined the effects of adult social and personality factors on the outcome variable together with childhood factors in Step 1. Gestational age and birth weight were controlled in the analysis.

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