Emotional stability, conscientiousness, and self-reported hypertension in adulthood

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ABSTRACT

This study aimed to investigate social and psychological factors in childhood and adulthood associated with self-reported hypertension in adulthood. Using data from the National Child Development Study, a nationally representative sample of 17,415 babies born in Great Britain in 1958 and followed up at 11, 33, and 50 years of age. Self-reported diagnosed hypertension by 50 years was the outcome measure. In total, 5753 participants with complete data on parental social class at birth, childhood cognitive ability test scores at 11 years, educational qualifications at 33 years, personality traits, occupational levels, and self-reported hypertension (all measured at age 50 years) were included in the study. Using logistic regression analyses, results showed that sex (OR = 0.60: 0.49–0.73, p < .001), educational qualifications (OR = 0.59: 0.37–0.92, p < .001), and traits emotional stability (OR = 0.84: 0.77–0.92, p < .001) and conscientiousness (OR = 0.89: 0.82–0.98, p < .001) were all significantly associated with the occurrence of self-reported hypertension in adulthood. Both psychological factors and socio-demographic factors were significantly associated with self-reported hypertension in adulthood.

1. Introduction

Worldwide, raised blood pressure/hypertension (Systolic Blood Pressure > 140; Diastolic > 90 mm Hg) is estimated to cause about 12.8% of the total of all deaths. Raised blood pressure is a major risk factor for coronary heart disease and ischemic as well as hemorrhagic stroke. Overall, approximately 20% of the world’s adults are estimated to have hypertension (WHO, 2002).

In this study we are using self-reported blood pressure. There is considerable evidence of the validity of self-report measures with correlations between objective and subjective measures around r = .60, also showing females and obese people being more accurate (Giles, Croft, Keenan, Lane, & Wheeler, 1995; Huerta, Tormo, Egea-Caparrós, Ortega-Devesa, & Navarro, 2009).

There is a long-standing literature on personality correlates of health and illness, as well as longevity (Chapman, Roberts, & Duberstein, 2011; Friedman & Kern, 2014). Studies have shown that personality consistently related to physiological reactions to stress which in part explains why it is correlated with chronic illnesses like hypertension (Bibbey, Carroll, Roseboom, Phillips, & de Rooij, 2013).

A number of previous studies have looked at personality and other psychological variables specifically associated with hypertension. However, the literature is sometimes handicapped by the use of poorly validated personality tests, and relatively small samples. For example in Zugelj et al. (2010) study 97 hypertensive adolescents using a little-known Slovenian measure of the Big Five.

Various measures of individual temperament have been found to be associated with hypertension, with the Dominant Cyclothymic Temperament (as a part of the Temperament Evaluation for Memphis, Pisa, Paris, and San Diego Auto-questionnaire) significantly increasing the odds of hypertension independent of biological factors, including age, BMI, and diabetes mellitus (Eory et al., 2014). Research on hostility shows that high levels of hostility lead to higher blood pressure specifically within young adults (Yan et al., 2003) and across a range of ages (Siegler, Peterson, Barefoot, & Williams, 1992). Cross-culturally, an investigation with Finnish males found that high levels of hopelessness resulted in a three times higher incidence of hypertension (Everson, Kaplan, Goldberg, & Salonen, 2000), and high levels. Defensiveness has been found to correlate with normotensive individuals developing hypertension over a three year period (Rutledge & Linden, 2000). The evidence suggests that tendencies to hostile impulses, antagonism, and denial seem to relate to higher blood pressure, though results from different studies are inconsistent (Leclerc, Rahn, & Linden, 2006).

Studies using the 16PF test (Cattell et al., 1970) have found a negative association between emotional stability (neuroticism),...
intelligence and hypertension and positive relationships between conventionalism, insecurity, conservatism, and tension in individuals with high blood pressure (Kidson, 1971; Spiro, Aldwin, Ward, & Mroczek, 1995). Using Eysenck’s Personality Inventory (Eysenck & Eysenck, 1975) investigations have revealed that males who are neurotic introverts and tough-minded extraverts, whilst females who are neurotic introverts and low on psychotism, have increased levels of hypertension (Mellors, Boyle, & Roberts, 1994). Extraversion has also been noted to be associated specifically with lower systolic blood pressure (Burke et al., 1992), whilst higher neuroticism in general is correlated with hypertension. Earlier Brody, Veit, and Rau (1996) found that neuroticism was negatively associated (r = −.38) with mean blood pressure increase over a 4-year period in 75 German normotensives.

Anxiety, especially trait anxiety, has been found to be linked to hypertension incidence (Sanz, Garcia-Vera, Magan, Espinosa, & Fortún, 2007). A meta-analysis revealed that negative affectivity (one of the main features of neuroticism) and defensiveness traits were positively correlated with higher blood pressure for older samples, but negatively correlated for younger samples (Jørgensen, Johnson, Koldozej, & Schreer, 1996). Furthermore, individuals who were unaware of their high blood pressure/primary hypertension showed a negative association with negative affectivity, whilst those who were aware showed a positive relationship.

The results on the relationship between personality and hypertension are however inconclusive and equivocal. Few have used measures of the Big Five personality structure which has dominated this area for the last 20 years (Friedman & Kern, 2014). There also seems to be little theoretical explanation as to why particular traits may be related to chronic hypertension. For instance, it may be hypothesised that extraverts need for excitement and stimulation which may lead to a lifestyle that increases hypertension over time. Similarly, as has been demonstrated so often, conscientiousness acts as a protective factor because of the way that highly conscientious people pay attention to medical advice, postpone their gratification and have planful and orderly lives (Cheng, Treglown, Montgomery, & Furnham, 2015). Further, as many studies reviewed above have suggested trait and state anxiety (strong correlates of trait neuroticism) is related to hypertension, because compared with low neurotic individuals, high neurotic individuals used less-adaptive coping strategies and reacted with more distress (Gunthert, Cohen & Armell, 1999).

This study seeks to replicate that of Turiano et al. (2011) who looked at the relationship between the Big Five personality traits and self-reported blood pressure in 3990 middle aged Americans. They found that higher levels of conscientiousness and lower levels of neuroticism were related to lower blood pressure. They also found that increasing age, lower levels of education and being male were associated with higher blood pressure. However they found that together the demographic and personality variables accounted for very little of the variance.

There are many established demographic and sociological correlates of health in general and hypertension in particular. Males are more hypertensive than females, and blood pressure increases with age. These differences occur across all national groups (Joffres et al., 2013). Social class and education have been found to be associated with various health outcomes (Wilkinson & Marmot, 2003), and with hypertension (Turiano et al., 2011; Williams, 2010). Intelligence has been found to be associated with mortality (Batty et al., 2009).

The aim was to determine the association between the big five personality traits and self-reported hypertension at age 50, adjusting for a range of socio-economic and cognitive covariates (social class, education and intelligence). From the previous literature we predicted that higher childhood intelligence, traits emotional stability, introversion and conscientiousness would be significantly and inversely associated with self-reported hypertension.

2. Method

2.1. Sample

The National Child Development Study, the 1958 British birth cohort, 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). The following analysis is based on data collected when the study participants were at birth, at ages 11, 33 and 50 years. At age 11 years, children completed tests of cognitive ability (response = 87%). At age 33 cohort members provided information on educational qualifications obtained (response = 72%). At age 50 years, cohort members provided information on current occupational levels (response = 67%), participants also completed a questionnaire on personality traits (response = 69%), and provided information on whether they are currently suffering from high blood pressure/hypertension (response = 79%). The analytic sample comprises 5753 cohort members (50% 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 (Plewis, Calderwood, Hawkes, & Nathan, 2004). Bias due to attrition of the sample during childhood has been shown to be minimal (Davie, Butler, & Goldstein, 1972; Fogelman, 2015).

2.2. Measures

1. Childhood measures:
   a. 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; IIII skilled non-manual; IIII 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.
   b. Childhood cognitive ability tests (Douglas, 1964) were accessed when cohort members were at age 11 years consisting of 40 verbal and 40 non-verbal items and were administered at school.

2. Adulthood measures:
   a. Education: At age 33, participants were asked about their highest academic or vocational qualifications. Responses are coded to the six-point scale of National Vocational Qualification (NVQ) levels which range from ‘none’ to ‘university degree/higher/equivalent NVQ 5 or 6.
   b. Occupation: Data on current or last occupation held by cohort members at age 50 years were coded according to the Registrar General’s Classification of Occupations (RGSC), using a 6-point classification mentioned above.
   c. 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. This has excellent psychometric properties and used in various other papers (e.g. Cheng et al., 2015).

3. Hypertension: At age 50 participants provided information on the prevalence of hypertension to the question “Are you currently suffering from high blood pressure/hypertension?” with Yes/No response.

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