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The subjective well-being of adults born preterm

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ABSTRACT

Preterm birth (<37 weeks' gestation) is sometimes associated with poorer outcomes in adulthood (e.g., poorer health, fewer intimate relationships, and lower income). However, few studies have examined how these adults felt about their lives or how personality affected these associations. 11,592 preterm and 51,460 full term adults completed online surveys measuring their subjective well-being (life, relationship and job satisfaction, and health). Adults born preterm reported similar levels of relationship satisfaction, but poorer health, life satisfaction and job satisfaction. Adults who reported having long hospital stays at birth also reported poorer health, life, relationship and job satisfaction, and this poorer well-being appeared to be accounted for, in part, by factors such as their personality.

1. Introduction

Outcome studies have demonstrated that preterm birth (before 37 weeks' gestation) is associated with poorer health (Cooke, 2004; Hack, 2009; Hack, Cartar, Schluchter, Klein, & Forrest, 2007; Lindstrom, Lindblad, & Hjern, 2009), reduced likelihood of forming romantic relationships (Hack, 2009; Moster, Lie, & Markestad, 2008; Wolke, 2011), poorer educational attainment, and lower salaries (despite equal levels of employment; Cooke, 2004; Hack, 2009; Lindstrom, Winbladh, Haglund, & Hjern, 2007; Moster et al., 2008; Wolke, 2011). Small samples tend to involve rich data collected from individuals over time (often starting soon after birth) but do not have sufficient power to explore the role of confounding variables or allow subgroup analyses (Saigal, 2013). In comparison, the large national register samples allow such analyses and include information about objective variables such as educational attainment, employment status, health and living situation (living with a partner, peers or parents; Lindstrom et al., 2009, 2007; Moster et al., 2008) but not subjective evaluations of these circumstances (Saigal, 2013). In order to have a sample comparable in size to that of national register samples, which also included subjective assessments of life, relationship and job satisfaction, we collected data using an online survey. This method allowed us to collect information from a larger number of individuals. The resulting sample closely resembled the general population of UK (Rentfrow, Jokela, & Lamb, 2015), and was large (the subsample studied here included over 60,000 adults) so ensured sufficient power to examine the role of potential covariates and to compute robust effect sizes.

Subjective wellbeing reflects individual beliefs and feelings and is related to health and social relationships (Diener, 2012). Therefore, the first aim of this study was to understand the adult sequelae of preterm birth with an emphasis on subjective accounts of their health, relationships, jobs and lives. Despite their importance, little is known about the subjective well-being of adults born preterm (Guyatt & Cook, 1994; Saigal, 2013) although the quality of life experienced by preterm and full term-born individuals tend to be similar when rated by the individuals rather than their parents (Cooke, 2004; Hack, 2009; Hack et al., 2007; Roberts et al., 2013; Saigal & Tyson, 2008; Zwicker & Harris, 2008). Less is known about life satisfaction, which involves comparing current circumstances with subjective standards set by the individuals themselves (Diener, Emmons, Larsen, & Griffin, 1985). Adults born small for gestational age had levels of life satisfaction similar to those of individuals with normal birthweight in one study (Strauss, 2000), but similar data are not available for adults born preterm.

In terms of health, adults born preterm tend to report poorer health outcomes than those born at full term. In one study, for example, both male and female adults born preterm had lower levels of physical functioning, female preterm adults reported role

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limitations due to emotional problems, mental health and lack of energy, and male preterm adults perceived their general health to be poorer (Cooke, 2004). Preterm adults were also more likely to have chronic conditions (primarily, asthma), be hospitalized for psychiatric conditions, have a diagnosis of ADHD or autism spectrum disorder, and be taking prescription medicines (Cooke, 2004; Hack, 2009; Hack et al., 2007; Johnson & Marlow, 2014; Lindstrom et al., 2009). Therefore, prematurity appears to be related to poorer objective and self-reported health. However, a sample of 55 adults born preterm reported slightly better physical health than community norms in a recent study (although mental health appeared worse than community norms in the sample; Natalucci et al., 2013).

Research on the socio-economic sequelae of prematurity has generally focused on objective outcomes (for example, relationship or employment status) rather than how individuals feel about their relationships or jobs. Studies focused on objective measures have shown that individuals born prematurely are less likely to form romantic relationships, start co-habiting with partners, find life partners, or become parents (Hack, 2009; Moster et al., 2008; Wolke, 2011). Cooke (2004) found similar proportions of preterm and full term adults in intimate relationships and in sexual relationships, but evidence regarding the effects on relationship satisfaction is less clear-cut. Relationship satisfaction has not been directly measured in adults born preterm although adults with very low birthweight reported less attachment-related anxiety than their normal weight peers (Pyhala et al., 2009). Preterm adolescents reported having fewer social interactions than full term adolescents, although they were rated equivalently adequate (Hallin & Stjernqvist, 2011). Furthermore, studies of objective socio-economic outcomes have demonstrated that preterm adults complete less schooling and leave school earlier than their peers (Cooke, 2004; Hack, 2009; Lindstrom et al., 2007) and despite being equally likely to be employed, preterm individuals had lower salaries (Hack, 2009; Lindstrom et al., 2007; Moster et al., 2008; Wolke, 2011). Because previous work has only focused on these objective measures of employment, this study asked adults born preterm about their job satisfaction.

The second aim was to understand how other variables affected the associations between preterm birth and outcomes. Personality may mediate relations between preterm birth and adult outcomes (Hack, 2009; Wolke, 2011), although conclusive evidence is lacking. Such hypotheses are based on findings that adults born preterm tend to score higher on measures of shyness, agreeableness, conscientiousness and neuroticism, and lower on measures of extraversion (Allin et al., 2006; Hertz, Mathiasen, Hansen, Mortensen, & Greisen, 2013; Pesonen et al., 2008; Schmidt, Miskovic, Boyle, & Saigal, 2008). This personality profile may help explain some of the differences in adult outcomes. For example, higher conscientiousness is related with better health and better longevity (e.g., Friedman & Kern, 2014; Friedman, Kern, Hampson, & Duckworth, 2014; Roberts, Walton, & Bogg, 2005; Smith, 2006) while increased neuroticism is related to the increased diagnosis of illness (although results are more mixed for relations between neuroticism and health; Friedman & Kern, 2014; Smith, 2006). In addition, increased extraversion and decreased neuroticism were related to higher levels of subjective well-being (Diener, Suh, Lucas, & Smith, 1999). Therefore, the higher neuroticism and lower extraversion of adults born preterm may, for example, place these individuals at risk of poorer health and subjective well-being; whereas the higher conscientiousness of adults born preterm may help to protect these individuals from poorer health outcomes associated with prematurity. These differences in personality may also mediate relations between prematurity and the later formation of romantic relationships (Hack, 2009; Wolke, 2011) although conclusive evidence is lacking. One goal of the present study was thus to explore the extent to which personality accounts for some of the adult outcomes of prematurity.

In addition to differences in personality profiles, Hack et al. (2002) described the behavioral cautiousness of preterm individuals. Risky behavior, or its avoidance, may therefore also account for some adult outcomes (Wolke, 2011), with preterm adults appearing more risk adverse, and less likely to consume alcohol, use drugs, and go to clubs or pubs than full term adults (Cooke, 2004; Hack, 2009; Hack et al., 2007, 2002, 2004; Pyhala et al., 2009; Roberts et al., 2013; Schmidt et al., 2008). Wolke (2011) questioned whether such behavioral cautiousness might reduce opportunities and thus help explain some adult outcomes of prematurity, so we examined the extent to which risky behaviors accounted for adult sequelae of prematurity.

Finally, demographic and childhood factors may play important roles in understanding adult outcomes. Premature delivery not only places babies in the world before they are biologically ready, but is also often combined with long periods of hospitalization following birth (Goldberg & DiVitto, 1983). Given long hospital stays at birth may reflect more extreme preterm birth or more medical complications at birth, we examined long hospital stays at birth as a predictor of adult outcomes (as well as birth status). In addition, premature deliveries occur more often among mothers of low socioeconomic status, who are under 15 years old, or who have had many pregnancies close together in time (Behrman & Butler, 2006; Goldberg & DiVitto, 1983). These conditions themselves place children at increased risk. Therefore, preterm delivery may combine biological immaturity with environmental risk. As a result, demographic (family-of-origin socioeconomic status) variables need to be considered when seeking to assess the specific effects of preterm birth on adult outcomes. In addition, preterm adults appear less likely to have children (Moster et al., 2008), which may affect the outcomes of interest (for example, relationship satisfaction) in this study. Therefore, being a parent also needs to be considered as a potential confounding variable for adult outcomes.

2. Method

2.1. Study sample

A sub-sample of cases was drawn from data collected using an online survey advertised (through webpages, and television and radio channels) and hosted by the British Broadcasting Corporation. 556,330 participants, aged between 18 and 80 years, responded between November 2009 and April 2011. Participants were excluded if data were missing (either due to no response or responses such as "rather not say" or "don't know") regarding preterm birth or confounding variables, resulting in a subsample of 63,052. Individuals without missing data were younger, $t(84429.77) = -43.20$, $p < .001$, $d = 0.17$, were 1.21 times more likely to be female, χ^2 ($N = 537{,}077$) = 462.20, $p < .001$, and were higher on family-of-origin SES, $t(90957.62) = 22.92$, $p < .001$, $d = 0.10$. Models were then run on the subsamples of individuals without missing data for the outcomes of interest. Only individuals in relationships and those who were employed were included in analyses of relationship satisfaction and job satisfaction, respectively.

2.2. Procedures

'The Big Personality Test' contained items pertaining to demographic and life histories (childhood, health, education, employment), personality, and well-being, among other topics (see the supplementary materials for the relevant sections of the survey). Before starting the survey, individuals were provided with