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Childhood adversity and psychiatric disorder in young adulthood: An analysis of 107,704 Swedes

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ABSTRACT

Childhood adversity (CA) is associated with increased risks of psychiatric disorder in young adulthood, but details in this association are less known. We aimed to explore the association of a range of CA indicators with psychiatric disorder in young adulthood, and the impact of age at exposure, disorder type and accumulation of indicators. We capitalized on Sweden's extensive and high-quality registers and analyzed a cohort of all Swedes (N = 107,704) born in Stockholm County 1987–1991. Adversities included familial death, parental substance misuse and psychiatric disorder, parental criminality, parental separation, public assistance recipiency and residential instability. Age at exposure was categorized as: 0–6.9 years (infancy and early childhood), 7–11.9 years (middle childhood), and 12–14 years (early adolescence). Psychiatric disorders after age 15 were defined from ICD codes through registers. Risks were calculated as Hazard Ratios (HR) with 95% confidence intervals (CI).

Results showed that exposure to at least one CA was associated with an increased risk of psychiatric disorder (HR 1.4, 95% CI: 1.3–1.4). Risks were increased for mood, anxiety, and psychotic disorders and ADHD but not for eating disorders. The risk varied with type of disorder but was similar for all exposure periods. Individuals with multiple (3+) CAs had a two-fold risk of psychiatric disorder (HR 2.0, 95% CI: 1.9–2.1). In conclusion, our findings support the long-term negative impact of CA on mental health, regardless of developmental period of exposure. Given that experience of CA is common, efforts should be put to alleviate the burden of childhood adversities for children, particularly among the most disadvantaged.

1. Introduction

There is accumulating evidence that childhood adversities (CAs) are associated with an increased risk of mental disorders in young adulthood, including substance misuse (Anda, 2008; Bellis et al., 2014; Dube et al., 2003; Kessler et al., 2010; McLaughlin et al., 2010a; Mersky et al., 2013), psychosis (Trauelsen et al., 2015), mood disorder (Anda, 2008; Björkenstam et al., 2015; Chapman et al., 2004; Kessler et al., 2010; McLaughlin et al., 2010a; Mersky et al., 2013; Sareen et al., 2013), and anxiety (Kessler et al., 2010; McLaughlin et al., 2010a; Mersky et al., 2013; Sareen et al., 2013). CAs may shape mental health through early life influences on neurodevelopment and psychosocial functioning.

Studies investigating adverse childhood experiences (ACE) as risk factors for psychiatric disorders have generally included adversities such as childhood abuse, neglect, and growing up in a dysfunctional household (Anda, 2008; Chapman et al., 2004; Felitti et al., 1998), the latter being characterized by substance misuse in the home, mentally ill family members, incarcerated parents etc. (Anda, 2008). CAs have been positively associated with the risk of psychiatric disorder in young adulthood in a number of recent studies. However, few studies have focused on to what extent the timing of exposure to CA affect subsequent onset of psychiatric disorder (Andersen and Teicher, 2008; Dunn et al., 2013; Heim and

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Binder, 2012; Kaplow and Widom, 2007; Khan et al., 2015) and whether the strength of the association depends on type of disorder and adversity. Furthermore, most previous studies have used retrospectively self-reported adversities and are, thus, limited by recall bias (Anda, 2008; Dube et al., 2003; Kessler et al., 2010; Mersky et al., 2013).

The results from the landmark ACE-study in San Diego (US) have suggested a framework for a new paradigm for medical, public health and social services (Felitti and Anda, 2010). The strong links between accumulations of childhood adversity, hypothesized to be indications of childhood traumas, and later psychiatric disorders have challenged a biological model of the etiology of psychiatric disorders (Skehan et al., 2012), but European replications based on the ACE-construct are still relatively few and far-in-between. Given that childhood adversities are common, any long-term detrimental effects on mental health would have an immense effect on both individuals and societies. Shedding light on the details of the CA and mental health relationship might inform the timing and targeting of public health interventions aiming to alleviate the burden of CA upon exposed children.

In the present study we capitalize on Sweden's extensive and high quality registers, by using a large sample of all individuals born between 1987 and 1991 in Stockholm County, Sweden. Our aim is to explore:

1. the association between different indicators of CA and the risk of psychiatric disorder in young adulthood, and whether the association differs by age at exposure and type of psychiatric disorder; and
2. the effects of cumulative exposure to multiple indicators of CA on the risk of psychiatric disorder

2. Methods

2.1. Study population

In total nine registers were merged to conduct the current analyses. The study population was defined as all individuals born in Stockholm County, Sweden between 1987 and 1991 (n = 116,087), recorded in the Medical Birth Register (Cnattingius et al., 1990). Stockholm County, with 11 municipalities, spans over an area of 2517 square miles. It has approximately 2.2 million people living in the metropolitan area. The Swedish health care system is publicly funded and there is universal access to it. Public mental health services comprise the large majority of mental health care since the percentage of population in contact with private psychiatrists is low (Dalman and Wicks, 2006). The depiction of the final analytical sample (n = 101,704) and exclusion criteria are illustrated in Fig. 1. Analyses not shown revealed that excluded individuals were more likely to have a foreign-born mother, to have been diagnosed with a psychiatric diagnosis before age 15 years, and to have experienced CA, as compared to the final analytical sample. The unique Swedish personal identity number was used to link this cohort to multiple health care and administrative registers:

The Causes of Death Register comprises information on all deaths of Swedish residents. The National Patient Register (NPR) includes all individuals admitted to psychiatric or general hospitals, with complete coverage for all care since 1987. In addition, an administrative health care database (VAL) was used containing individual data on utilization of publicly funded inpatient and outpatient health care in Stockholm County since 1997. The Total Enumeration Income Survey contains data on the income of and governmental benefits provided to all Swedish residents. The Total Population Register includes information on age, sex, place of residence, and other relevant demographic characteristics. The Longitudinal Integration Database for Health Insurance and Labor Market Studies (LISA) integrates existing data from the labor market, educational and social sectors. The Register of Court Convictions contains information on all court convictions in Sweden for persons 15 years of age or older. Families were linked together through the Multi-Generation register, which contains all known relationships between children and parents (born in 1932 or later) since 1961.

2.2. Measures

2.2.1. Indicators of childhood adversity

CA indicators were selected based upon prior research demonstrating them to have significant adverse health or social implications (Anda, 2008; Björkenstam et al., 2013; Farrington and Welsh, 2007; Rasmussen et al., 2014; Ringback Weitoft et al., 2008; Siegenthaler et al., 2012; Vinnerljung et al., 2010; Wood et al., 1993), and measured between birth and age 14. Based on the child developmental stage theories (Schaffer and Kipp, 2014), we chose the following three exposure periods: 0–6.9 years (infancy and early childhood), 7–11.9 years (middle childhood), and 12–14 years (early adolescence). These exposure periods were informed by previous developmental timing research (Schaffer and Kipp, 2014) and encompass major transitions in a child's life. If an individual was exposed to the same indicator more than once, one indicator in each sensitive period was considered.

Familial death: Death of a parent or a sibling.

Parental substance misuse: At least one parent hospitalized with a main diagnosis for alcohol and/or drug-related substance misuse (International Classification of Disease (ICD-9) codes: 291–292, 303–3050, 3570, 4255, 5353, 5710, 5711–5713, 6483, 6555, 9650, 9696–9697; ICD-10: E244, F10–F16, F18–F19, G312, G621, G721, I426, K292, K70, K852, K86, O354–355, P044, T40, T436, T51, Z502–503, Z714, Z721–Z722) and/or received an alcohol or drug-related conviction.

Parental psychiatric disorder (excluding substance misuse related diagnoses): At least one parent hospitalized with a main diagnosis of psychiatric disorder (ICD-9: 290–319; ICD10: F00–F99).

Severe parental criminality: A parent sentenced to prison, probation, or forensic psychiatric care.

Parental separation: Parental marital status was measured when the child was between the ages of 3 and 14. This indicator was coded as 1 if the parent's marital status changed from married to divorced between two years.

Household living on public assistance: This indicator, used as a proxy for relative poverty, was defined as at least one parent having received public assistance that constituted more than 50% of the yearly income during a year or more (when the child was between 3 and 14 years of age). In Sweden, public assistance is a form of cash income allowance from local social authorities after a thorough individual means test, designed to guarantee people a minimum standard of living (Hessle and Vinnerljung, 2000).

Residential instability: Two or more changes in place of residency.

2.2.2. Psychiatric disorder

The study population was prospectively followed for onset of psychiatric disorder after age 15 (from 2002 if born 1987 through 2006 if born 1991) until at most December 31st 2011. Psychiatric disorder was defined as a register-based diagnosis of any psychiatric disorder (ICD-10 codes F00–99) during psychiatric inpatient care, psychiatric outpatient care, and/or primary care, as recorded in the NPR and VAL Additionally, the following types of disorders were considered separately: substance misuse (ICD-10: F10–19);