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Preliminary communication

Depression and suicide ideation in late adolescence and early adulthood are an outcome of child hunger

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ABSTRACT

Background: Child hunger represents an adverse experience that could contribute to mental health problems in later life. The objectives of this study were to: (1) examine the long-term effects of the reported experience of child hunger on late adolescence and young adult mental health outcomes; and (2) model the independent contribution of the child hunger experience to these long-term mental health outcomes in consideration of other experiences of child disadvantage.

Methods: Using logistic regression, we analyzed data from the Canadian National Longitudinal Survey of Children and Youth covering 1994 through 2008/2009, with data on hunger and other exposures drawn from NLSCY Cycle 1 (1994) through Cycle 7 (2006/2007) and mental health data drawn from Cycle 8 (2008/2009). Our main mental health outcome was a composite measure of depression and suicidal ideation.

Results: The prevalence of child hunger was 5.7% (95% CI 5.0–6.4). Child hunger was a robust predictor of depression and suicidal ideation [crude OR=2.9 (95% CI 1.4–5.8)] even after adjustment for potential confounding variables, OR=2.3 (95% CI 1.2–4.3).

Limitations: A single question was used to assess child hunger, which itself is a rare extreme manifestation of food insecurity; thus, the spectrum of child food insecurity was not examined, and the rarity of hunger constrained statistical power.

Conclusions: Child hunger appears to be a modifiable risk factor for depression and related suicide ideation in late adolescence and early adulthood, therefore prevention through the detection of such children and remedy of their circumstances may be an avenue to improve adult mental health.

1. Introduction

Food insecurity refers to the financial inability of households to access adequate food and is generally measured as moderate versus severe (Health Canada, 2007). Moderate food insecurity means that there is an indication that quality and/or quantity of food consumed have been compromised. Severe food insecurity means that there is an indication of reduced food intake and disrupted eating patterns. According to the 2007–2008 Canadian Community Health Survey (CCHS), the national prevalence of food insecurity is 8% for households overall, while the child-level of food insecurity is 5% (Statistics Canada, 2010a). Severe child food insecurity, analogous to the more emotive term 'child hunger', occurs in about 2% of Canadian children (Statistics Canada, 2010a).

Population-based studies have demonstrated that food insecurity affects specific vulnerable populations with well-described characteristics related to gender (women/mothers), age (children > adults), household composition (lone parent-led), household income (inadequate, poverty level), housing (rented), ethnicity (aboriginal off-reserve), and main income source (social assistance) (Che and Chen, 2001; Health Canada, 2007; Rainville and Brink, 2001; Statistics Canada, 2010a). Thus, children affected by severe food insecurity likely live in conditions of general child adversity.

There is good evidence from Canada and the United States that demonstrates that household food insecurity is associated, in cross-sectional studies, with a range of poor physical health outcomes among children (e.g., Alaimo et al., 2001; McIntyre et al., 2000; Broughton et al., 2005; Gundersen and Kreider, 2009; To et al., 2004). A sparser literature has shown that food insecurity in childhood has long-term negative impacts on physical health (Casey et al., 2010), including chronic conditions such as asthma,

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even when controlling for confounding conditions of baseline health, preexisting chronic conditions and other household markers of disadvantage such as low income and rental housing (Kirkpatrick et al., 2010).

Less is understood about the food insecurity- mental health relationship. Cross-sectional studies have demonstrated a relationship between child food insecurity and child and youth mental health problems. Weinreb et al. (2002) found that school-aged children with severe hunger had significantly higher anxiety and internalizing behaviors independent of other associations. Alaimo et al. (2001) examined dysthymia and suicidal ideation in food insufficient adolescents and found a significant independent association. A small prospective study from the United Kingdom found that food insecure children, followed for 2 to 5 years until age 12, had moderately higher levels of emotional problems relative to food secure children when adjusted for various household environmental and maternal variables (Belsky et al., 2010). Another two year follow up study of children 4 to 14 years in the United States found that children from food insecure households were significantly more likely to have internalizing and externalizing problems, independent of poverty status (Slopen et al., 2010).

A burgeoning literature on food insecurity among women deals with the impact of mothers' depressive symptomatology on adverse child outcomes such as problem behaviors (Whitaker et al., 2006) as well as her depression appearing to perpetuate the household living in a food insecure state (Casey et al., 2004; Melchior et al., 2009). Such studies add to well-established evidence that maternal depression is associated with a small but consistently increased risk of behavioral, emotional, and developmental problems in their children across the developmental age span (Goodman et al., 2010). Maternal depression is usually considered to contribute to these associations through poor parenting and parental interactions with their children (Goodman et al., 2010). From an epidemiological point of view, only a longer term prospective study can untangle the causal connections between child hunger and mental health of both the mother and the child.

Whitaker et al.'s (2006) early life stress hypothesis would predict longer term mental health problems resulting from the childhood experience of food insecurity. They have called for studies to examine whether or not household food insecurity does increase a child's susceptibility to later mental health problems. Slopen et al. (2010) also felt that their short-term follow up study of child disadvantage and behavioral problems implicated food insecurity as a novel risk factor for child mental well-being; suggesting that if causal, this might motivate prevention efforts.

We recognized that the National Longitudinal Survey of Children and Youth (NLSCY) presented a unique opportunity to study the long term impact of child and youth hunger on mental health in late adolescence and young adulthood. This is because of the richness of the dataset which includes a consistent hunger measure over sixteen years of follow up and a variety of sociodemographic variables and diverse health outcomes. The objectives of the study were therefore to: (1) examine the long-term effects of the reported experience of child/youth hunger on late adolescence and young adult mental health outcomes; and (2) model the independent contribution of the child/youth hunger experience to these long-term mental health outcomes in consideration of other experiences of child disadvantage.

2. Methods

The NLSCY was a long-term study conducted jointly by Statistics Canada and Human Resources and Skills Development Canada (HRSDC), which collected detailed data on the health, education, social development, and well-being of a representative sample of Canadian children and youth on a biennial basis from 1994 until 2009. The survey included both cross-sectional and longitudinal components. The longitudinal cohort is identified in Cycle 2 using a variable indicating that the record is for a longitudinal child. This cohort of children was aged 0 to 11 years in Cycle 1 ($n=15,468$); by Cycle 8 (2008/2009) they had reached 14 to 25 years. 68% of the original cohort ($n=22,831$) participated in Cycle 8, and 52% participated in every follow up.

2.1. Data and measures

We analyzed data covering 1994 through 2008/2009, with data on hunger drawn from NLSCY Cycle 1 (C1, 1994) through Cycle 7 (C7, 2006/2007) and mental health outcome data drawn from Cycle 8 (C8, 2008/2009). Over the course of 8 cycles, both the Person Most Knowledgeable about the child (PMK) reports and youth self-reports were collected; where there were discrepancies, we privileged youth over PMK reports. The C8 data were entirely youth-reported rather than PMK-reported.

The hunger question was left intact over all cycles: "Has [the child]/Have you ever experienced being hungry because the family has run out of food or money to buy food?" with response categories yes or no. The only exception was in C5 when the question was modified for youth 18–19 years by changing the time prior to 'past six months' from 'ever'. Although the hunger experience timeframe is 'ever', previous analyses show variation in reporting across cycles in relation to changes in known risk factors for food insecurity (e.g., income and household composition) (McIntyre et al., 2001; Kirkpatrick et al., 2010), suggesting that the reference period is likely interpreted as the time elapsing since the last administration of the survey. A respondent was considered to have ever experienced hunger ('ever hungry') if hunger was reported for at least one cycle by the PMK from C1 to C7 or by the youth between C4 and C7.

Sociodemographic information for all respondents was retrieved from all 8 cycles. Household sociodemographic covariates over C1–C7 could confound associations in the mental health outcome model; hence, their effects were smoothed over time. For example, we derived average household income ('permanent income'), and mean number of adults and children in the household over the exposure period. Other exposures were distilled to ever/never exposures, e.g., ever lived with a lone mother.

The key mental health outcome variable was depression, which was assessed in the NLSCY using an abbreviated version of the Center for Epidemiologic Studies Depression Rating Scale (CES-D). It was available for the full sample aged 14–25 years. A cut-off point of 21 was used to classify respondents into depressed or non-depressed categories. Because of high collinearity and to maximize sample size, this variable was combined with suicide ideation (yes/no), in which the youth was asked whether they had seriously considered or attempted suicide. The dataset included other scales that were related to the mental health of youth and young adults, specifically General Self-image (self-esteem and youth experiences), and Emotional Quotient (measure of emotional intelligence). These were examined as secondary mental health outcomes to determine the specificity of the depression/suicide ideation composite outcome for late adolescents and young adults who experienced child/youth hunger. A brief description of these measures is found in Table 1. In the absence of a meaningful diagnostic threshold for General Self-image and Emotional Quotient scores, the lower quartile was used in the analysis, indicating poor outcome.