Influence of Maternal Depression on Household Food Insecurity for Low-Income Families

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ABSTRACT

OBJECTIVE: To examine whether maternal depression predicts future household food insecurity for low-income families.

METHODS: This was a secondary data analysis using data from the Early Childhood Longitudinal Study, Birth Cohort (ECLS-B). The study cohort consisted of 2917 low-income mothers, defined as <185% federal poverty level, who were food secure at baseline. Maternal data collected when children were 9 and 24 months of age were used. Data at 9 months were considered baseline, and data at 24 months were considered follow-up. Baseline maternal depressive symptoms were measured by a 12-item abbreviated version of the Center for Epidemiologic Studies Depression Scale. Household food insecurity at follow-up was measured by the US Department of Agriculture Household Food Security Scale.

RESULTS: At baseline, 16% of mothers were depressed (raw score >9). Most mothers were white, unemployed, and born in the United States. The majority received Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) (86%); 39% received Supplemental Nutrition Assistance Program (SNAP). At follow-up, 11.8% of mothers reported household food insecurity. In multivariable analysis, maternal depression at baseline was significantly associated with food insecurity at follow-up (adjusted odds ratio 1.50; 95% confidence interval 1.06–2.12).

CONCLUSIONS: Our results suggest that maternal depression is an independent risk factor for household food insecurity in low-income families with young children. Multidisciplinary interventions embedded within and outside the pediatric medical home should be developed to identify depressed mothers and link them to community-based mental health and food resources. Further longitudinal and interventional studies are needed to understand and address the complex relationship between poverty, maternal depression, social safety nets, and food insecurity.

KEYWORDS: food insecurity; low income; maternal depression; WIC

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WHAT'S NEW

This nationally representative study suggests that maternal depression may be an independent risk factor for future household food insecurity in low-income families with young children. Our study findings have important implications for pediatric practice and public policy.

MATERNAL DEPRESSION AND household food insecurity are common stressors for low-income families. Approximately 40% to 59% of low-income mothers experience depression or depressive symptoms;[1–3] in 2012, 34% of low-income households, of which many are headed by women, experienced food insecurity.[4] Both maternal depression and food insecurity are independently associated with detrimental child health and developmental outcomes, including poor growth, impairments in social development, emotional difficulties, and cognitive deficits.[5–9]

Prior studies have demonstrated that maternal depression and food insecurity are highly correlated.[9–13] The literature, however, consists primarily of cross-sectional and small-cohort studies involving specific subpopulations. The temporal relationship between maternal depression and food insecurity therefore remains unclear. Theoretically, depression may lead to food insecurity by impairing a mother's decision making abilities, her abilities to shop, cook or work, or her use of social safety net programs such as Special Supplemental Nutrition Program for Women, Infants, and Children (WIC).[11,14] Elucidating this relationship between maternal depression and food insecurity is important in order to develop public policy and practice-based interventions aimed to reduce hunger and optimize health and development in low-income children.

The study's aim was to examine the influence of maternal depression on future household food insecurity in low-income families with young children using a large nationally representative data set. We hypothesized that maternal depression would be predictive of food insecurity.

PATIENTS AND METHODS

STUDY DESIGN AND SAMPLE

We conducted a cohort study using data from the Early Childhood Longitudinal Study, Birth Cohort (ECLS-B). The ECLS-B is sponsored by the National Center for Education Statistics (NCES) and consists of a nationally representative sample of children born in the United States in 2001 and followed prospectively through 2007. Data were collected on children's cognitive, socioemotional, psychomotor, and physical development via face-to-face parent interviews, direct cognitive and developmental assessments, and information from birth certificates.[15]

Data collected when children were 9 and 24 months of age were used in this study. Data at 9 months were considered baseline, and data at 24 months were considered follow-up. Overall, the ECLS-B cohort included 10,700 infants at 9 months and 9850 children at 24 months. To examine the predictive relationship between maternal depression and food insecurity, we limited our sample to low-income mothers with household food security at baseline. We defined low-income as <185% federal poverty level (FPL) because this is the income cutoff for WIC, which is the largest supplemental food program in the United States designed to safeguard the health of low-income women, infants, and young children.[16] The 18-item US Department of Agriculture (USDA) Household Food Security Scale (FSS) was used to measure household food insecurity at baseline in respondent mothers during face-to-face interviews.[17] The FSS assesses hunger in the past 12 months and enables derivation of 3 food security status categories: food secure, food insecure without hunger, and food insecure with hunger. Of note, in 2006 the USDA changed this terminology from food insecurity without hunger and food insecurity with hunger to low food security or very low food security. Following a convention used by other investigators, we dichotomized household food security to "food secure versus food insecure" by collapsing the 2 food-insecure categories into a single category.[18,19] The FSS has been shown to have high reliability, as measured by Cronbach's alpha, ranging from 0.86 to 0.93.[20] Overall, 2917 families met eligibility criteria and were included in this study.

DEPENDENT VARIABLE

The USDA FSS was also used to measure household food insecurity at follow-up in respondent mothers during face-to-face interviews.[17]

INDEPENDENT VARIABLE

Maternal depressive symptoms were measured by a 12-item abbreviated version of the Center for Epidemiologic Studies Depression Scale (CES-D).[21] This short form has been previously validated and assesses depressive feelings and behavior during the past week via a 4-point Likert scale categorizing the raw symptom score as no, mild, moderate, or severe depressive symptoms. Following Silverstein and colleagues,[22] we a priori defined a mother to have depression if she had a raw score of >9, consistent with having moderate or severe symptoms.

COVARIATES

For this study, covariates included maternal and household characteristics that were hypothesized on the basis of documented or theoretical relevance to be associated with household food insecurity and/or maternal depression. These covariates included predictive risk factors such as race/ethnicity, age, marital status, employment, education, mothers' foreign-born status, household income, and maternal self-reported health status.

STATISTICAL ANALYSIS

Descriptive statistics were used to report the sociodemographic characteristics of the study sample. Individual-level weights from ECLS-B were used to provide valid national population estimates. Using weighted data, we used Pearson's χ^2 test to measure the association between household food insecurity at follow-up and baseline maternal depression and sociodemographics. Multivariable logistic regression was used to estimate the relationship between maternal depression at baseline with food insecurity at follow-up adjusting for covariates. As a result of the complex sampling design, Taylor series estimation was used to determine valid confidence intervals. Because we also wanted to assess whether supplemental food programs affected the relationship between maternal depression and food insecurity, we tested for effect modification by WIC and Supplemental Nutrition Assistance Program (SNAP) by entering interaction terms into the multivariable regression models; if an interaction was found to be significant, we then stratified the data set by the effect modifier and examined the association between maternal depression and food insecurity within each stratum. We performed analyses using SAS v9.1.[23]

The study was approved by the Boston University Medical Center institutional review board. This article was reviewed by the NCES to assess its compliance with the terms of the ECLS-B restricted data use license.

RESULTS

SAMPLE CHARACTERISTICS

The largest proportion of our sample of low-income mothers was white (37.5%), and most were born in the United States (71.8%); 52.4% had household income below the FPL. Most mothers had not completed college (96.6%) and were unemployed (59.7%). The mean maternal age was 25.5 years (Table 1).

At baseline, 16.1% of mothers were depressed. Overall, the majority of mothers received WIC benefits (86.7%); fewer received SNAP (39.2%) (Table 1).

At follow-up, 11.8% of mothers reported household food insecurity.