



Family socioeconomic status and maternal depressive symptoms: Mediation through household food insecurity across five years[☆]



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ABSTRACT

Rationale: Food insecurity is a significant social problem that has been found to co-occur with both poverty and depression. However, few studies have utilized longitudinal data to investigate the associations among poverty, depression, and food insecurity.

Objective: This study tested two competing hypotheses, the food inadequacy hypothesis and the mental health hypothesis, in examining the associations among family socioeconomic status (SES), maternal depression, and household food insecurity across children's first five years of life.

Methods: Data were drawn from the Early Childhood Longitudinal Study-Birth Cohort (ECLS-B), a dataset nationally representative of all children born in the United States in 2001. Mothers reported family SES and household food insecurity when their children were nine months, 24 months, four years, and at kindergarten entry; maternal self-rated depressive symptoms were included at nine months, four years, and kindergarten entry.

Results: An autoregressive cross-lagged model showed that family SES was predictive of later household food insecurity, which in turn was associated with later maternal depressive symptoms. Significant mediation pathways were found with household food insecurity mediating the link between family SES and maternal depressive symptoms.

Conclusions: This study highlights the need to consider household food insecurity as an underlying mechanism of maternal depressive symptoms in under-resourced families. Findings of this study can inform public health policy by highlighting the importance of considering factors such as food insecurity in the delivery of services to depressed mothers and their children in under-resourced contexts, and emphasizing the need for coordinated, integrated care in responding to the needs of these high-risk, vulnerable families.

1. Introduction

Food insecurity, defined as lacking access at times during the year to enough food for active healthy lives for one or more household members, is a critical health-related social problem (Fleegler et al., 2007) that affected one in eight Americans in 2016. Although food insecurity

tends to happen in low resource families (Casey et al., 2006; Whitaker et al., 2006), it has also been suggested that maternal mental health issues, particularly maternal depression, can co-occur with low socioeconomic status (SES) and household food insecurity (Melchior et al., 2009; Bronte-Tinkew et al., 2007).

Although there is some evidence addressing the relation between

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food insecurity and maternal depression (e.g., Melchior et al., 2009; Bronte-Tinkew et al., 2007), these fail to consider the effects of SES on both food insecurity and maternal depression. Further, these previous studies may fail to examine the direction of the relation between maternal depression and food insecurity in the context of poverty, or investigate the relations longitudinally (e.g., Casey et al., 2004; Hadley and Patil, 2006; Melchior et al., 2009). Addressing this gap in the current literature can help us better understand and assist low-resource families with food insecurity and mental health concerns. Thus, the current study presents two competing hypotheses to address this issue and attempts to unravel the chronological relations among family SES, household food insecurity, and maternal depressive symptoms.

1.1. The food inadequacy hypothesis

In the context of poverty, food insecurity is a chronic and reoccurring stressor that may be associated with feelings of hopelessness and depression (Whitaker et al., 2006). Previous studies posited that food insecurity, both with and without hunger, is an extreme stressor on household members, especially for caregivers (e.g., Hadley and Patil, 2006; Whitaker et al., 2006). Biologically, limited access to healthy food is related to higher rates of future depression (Sánchez-Villegas et al., 2012). Food insecurity alters immune functioning and is associated with increasing inflammatory markers such as C-reactive protein and interleukin-6 (Gowda et al., 2012). In turn, inflammation can alter the production and metabolism of neurotransmitters (e.g., dopamine, serotonin) that influence mood change (Capuron and Miller, 2011) and disrupt hypothalamic-pituitary-adrenal axis function that plays a key role in depression (Kiecolt-Glaser et al., 2015). The effect of food insecurity on depression may be even more severe among mothers, as it is suggested that nursing mothers are exposed to a process called variable foraging demand when there is instability and unpredictability in mothers' ability to obtain food for their children (Rosenblum and Pauly, 1984). It is proposed that mothers exposed to this stressor have increased levels of parenting stress and tension with their children, thus increasing the mother's level of depressive symptoms (Whitaker et al., 2006). As such, food insecurity may be a significant predictor of later maternal depression, as inadequate and inconsistent access to food for either herself or her children may increase a mother's stress or anxiety about survival and feeding (Hadley and Patil, 2006). Thus, the first hypothesis, called the food inadequacy hypothesis, is that a low-resource household is associated with maternal depression in later years in part through household food insecurity.

1.2. The mental health hypothesis

A few other studies have suggested that in the context of low resource settings, an important risk factor for a family's inadequate food access is the mother's experience of mental health problems (Wehler et al., 2004; Melchior et al., 2009). Maternal depression, especially, may increase the difficulty a mother might experience in fulfilling parenting and household responsibilities successfully (Casey et al., 2004). Depression in mothers may make it difficult for them to obtain food and to organize and prepare meals for their young children (Casey et al., 2004; Melchior et al., 2009). Depression may also affect a mother's capacity to maintain employment and thus a stable income for food (Corman et al., 2016; Lerner and Henke, 2008). Depressed mothers may neglect family members' food and nutritional needs due to the lack of energy associated with a depressed mood (Kaplan et al., 1999; Leschied et al., 2005). As financial strains show a consistent relation with depression among household members (Lorant et al., 2003), it is possible that maternal depression underlies the link between low resource and food insecurity. Hence, the second hypothesis, called the mental health hypothesis, suggests that food insecurity may arise as a result of maternal depression.

1.3. The current study

Previous studies suggest intertwined relations among low SES, food insecurity, and maternal depression, without clarification about the direction of these relations because most of these previous studies tended to measure food insecurity and maternal depression at the same time point (e.g., Hadley and Patil, 2006; Melchior et al., 2009), whereas the chronological relations between these two factors have been less investigated. Moreover, most previous studies investigating the relations between food insecurity and maternal depression did not control for the effect of SES on both factors, or they utilized a single population comprised of low-SES mothers only (e.g., Casey et al., 2004; Hadley and Patil, 2006). Given that both food insecurity and maternal depression are predictors of adverse child outcomes (Casey et al., 2006; Lovejoy et al., 2000), it is important to investigate the mechanisms by which low SES is associated with both these variables, and whether mediation relations exist (i.e., low SES – food insecurity – maternal depression, or low SES – maternal depression – food insecurity); a better understanding of these relationships can lead to improved targeting of prevention and intervention efforts.

The current study aims to investigate the reciprocal relations among SES, food insecurity, and maternal depressive symptoms in a nationally representative sample of mothers interviewed when their target child was nine months, two years, four years, and at kindergarten entry. An auto-regressive model was adopted to examine the stability of each factor over time, with cross-lagged paths estimated to predict each factor from the other factors at the previous time point. It was expected that lower SES would be associated with both future food insecurity and maternal depressive symptoms. Two mediation pathways were tested following two competing hypotheses. Following the food inadequacy hypothesis, the first mediation path tested whether lower SES would be associated with later elevated maternal depressive symptoms through food insecurity. The second mediation path, consistent with the mental health hypothesis, examined whether lower SES would be associated with food insecurity through higher maternal depressive symptoms.

2. Method

2.1. Participants

Data were drawn from the Early Childhood Longitudinal Study, Birth Cohort (ECLS-B), a nationally representative sample of over 10,000 children born in the United States in 2001. The ECLS-B data oversampled minorities such as Asians and American Indians, low birth weight infants, and twins. The goal of the ECLS-B was to examine the individual, family, and community level factors that are associated with children's health and developmental trajectories in the first five years of life. The first four waves of data collection were included in the current study: baseline parent interviews and child assessments were completed when the child was approximately nine months old, and then repeated at 24 months, four years, and kindergarten entry (see Bethel et al., 2005, for a detailed description of the study design). The data spanned the years from 2001 to 2006. The current sample included 6970 children (50.8% male) whose families completed the survey at wave 4 when the target child was ready for kindergarten entry ($M = 65.11$ months, $SD = 3.78$). Inclusion of only families who had completed the wave 4 survey was based on the consideration of applying the proper sample weight, which is the last wave in the data analysis (Nord et al., 2006). Although using the weight may result in a slightly smaller analytic sample, it will adjust for the selection of the sample and non-response, to ensure the representativeness of the sample (Nord et al., 2006).

2.2. Measures

Socioeconomic status. Family SES was assessed with a combined

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