



## Research paper

## The association of food insecurity with health outcomes for adults with disabilities



Debra L. Brucker, MPA, PhD

University of New Hampshire, Institute on Disability, 10 West Edge Drive, Suite 101, Durham, NH 03824, USA

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## ABSTRACT

**Background:** Adults with disabilities are more likely to live in households that are food insecure and are more likely to experience health disparities than adults without disabilities. Research examining the intersection of food insecurity and health outcomes for adults with disabilities has so far been lacking, however.

**Objective/Hypothesis:** The research presented here tests whether living in a food insecure household is associated with poorer self-reported health and mental health and different health care utilization, controlling for disability status and other sociodemographic characteristics.

**Methods:** Multivariate regression analyses are conducted using linked data from the 2011 National Health Interview Survey and the 2012 Medical Expenditures Panel Survey.

**Results:** Adults with and without disabilities who live in food insecure households have higher odds of reporting fair or poor health or mental health in either the current year or the subsequent year. Health care utilization patterns differ for adults who are food insecure as well, both within and across years.

**Conclusions:** Efforts to address health disparities among adults with disabilities should consider the possible additional impact of food insecurity on health outcomes.

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In the U.S., an estimated 40 million people, or 13% of the non-institutionalized population, have an ambulatory, cognitive or sensory disability.<sup>1</sup> Adults with disabilities have lower levels of educational attainment and labor force participation than their peers, resulting in a higher likelihood of living in poverty.<sup>2–4</sup> Americans with disabilities are thus significantly more likely to experience the consequences of poverty, including food insecurity.<sup>5–7</sup> Food insecurity is the inability to access the food necessary to support a healthy, active life. Research has estimated that between 24 and 34% of households that include an adult with a disability experience food insecurity. Rates of food insecurity are much lower (11 or 12%) for households that do not include a person with a disability.<sup>2,6</sup>

Food insecurity has been found to be associated with a number of poor health outcomes for the general population. For example, food insecurity has been linked to poorer levels of self-reported health<sup>8–12</sup> and mental health.<sup>7,13–15</sup> Health care utilization patterns differ for persons who are living in food insecure households,

with higher rates of emergency room visits and hospitalizations.<sup>12,16,17</sup>

Persons with disabilities, a population that is at increased risk for food insecurity,<sup>6</sup> already face a number of health disparities. For example, persons with disabilities report lower levels of physical and mental health than persons without disabilities.<sup>18</sup> Patterns of health care utilization differ between persons with and without disabilities as well, as persons with disabilities have higher rates of emergency department and inpatient visits than other persons.<sup>19–21</sup> Much research has examined health care disparities for persons with disabilities, finding that persons with disabilities experience restricted access to usual sources of care and increased rates of delaying care due to cost.<sup>20</sup>

As persons with disabilities already face a number of health disparities, an exploration of the association between food insecurity and health outcomes for persons with disabilities can provide information that can be used by policymakers and service providers as they coordinate efforts to provide effective health and nutrition services for this vulnerable population. The research presented here, using data from the 2011 National Health Interview Survey (NHIS) linked with 2012 data from the Medical

E-mail address: [debra.brucker@unh.edu](mailto:debra.brucker@unh.edu).

Expenditures Panel Study (MEPS), allows for the first exploration of linkages among food insecurity and several health outcomes for adults with disabilities across years. This study focuses on self-reported health and mental health as well as two measures of health care utilization, emergency room visits and inpatient visits. The following hypotheses are tested:

Adults who are living in food insecure households exhibit poorer *self-reported health and mental health status* than adults who are living in food secure households, holding disability status and individual factors constant.

The *utilization of health care* differs between adults who are living in food insecure and food secure households, holding disability status and individual factors constant.

Results suggest that household level food insecurity is linked with poorer health outcomes for persons with and without disabilities in a subsequent year. After reviewing relevant literature in this area, analytical details and results are provided below.

## Methods

### Data

Publicly available data from the 2011 National Health Interview Survey (NHIS) and the 2012 Medical Expenditure Panel Survey (MEPS) were linked using the NHIS-MEPS Link Files.<sup>22</sup> The NHIS is a population-based health survey that is designed to monitor the health of the US noninstitutionalized population. Data are collected directly from household members who self-report health status, health behaviors, and health outcomes. The MEPS is a set of large-scale surveys of families and individuals, their medical providers, and employers that collects information on the cost and use of health care and health insurance coverage. The MEPS is administered to a subset of families and individuals who participated in the prior year NHIS. Individual-level cases in the MEPS can therefore be linked to individual cases in the NHIS using unique identification numbers (provided in the link files mentioned above). Both surveys are designed to provide nationally representative estimates, allowing for broad generalizability of associated research results.

Restricting the analytic sample to adults age 18 or older who were included in the 2011 NHIS and who were then followed in the 2012 MEPS data resulted in an initial unweighted sample of 12,933. The resulting file included two years of data for each individual. Differences in the variables included in each year of data are described in more detail below. The University of New Hampshire (UNH) does not require IRB approval for studies that include the use of publicly available secondary data.

### Measures

#### Disability

Disability was defined as persons who noted having one of the following limitations: ambulatory, cognitive, hearing, vision, independent living or self-care. These limitations are commonly used across federal surveys to identify persons with disabilities and are currently available in both the NHIS and the MEPS. Only persons who identified as having the same limitation across all years were identified as having a disability. This excluded persons who experienced short-term activity or functional limitations or who acquired disability during this time period.

#### Food insecurity

Food insecurity status was only available within the NHIS data (Year 1 of our analytical file) and was measured for the past month

at the household level using a series of questions developed by the U.S. Department of Agriculture. A binary indicator of food insecurity at the household level was created, with a value of one indicating “food insecurity” (low or very low food security). A value of zero indicated marginal or high food security. This provides our baseline measure of food insecurity, in Year 1 of our data.

#### Health outcomes

Health outcomes, examined within both the NHIS and the MEPS data, were defined to include self-reported health, self-reported mental health, emergency department visits and inpatient visits. Self-reported health status, included in both the NHIS and the MEPS, was categorized as poor, fair, good, very good, or excellent. Prior research has suggested that self-rated health measures are good proxies for actual health.<sup>23,24</sup> Persons with disabilities self-rate health differently than persons without disabilities, however, being more likely to report poorer health.<sup>25</sup> We dichotomized this variable, where a value of one indicated fair or poor health and a value of zero indicated good or better health.

Self-reported mental health status was rated similarly to self-reported health. Self-reported mental health was only measured within the MEPS, so was therefore only available in Year 2 of the linked data.

Health care utilization was measured along two different dimensions viewed as indications of poorer health when controlling for health insurance coverage - emergency department visits and inpatient visits. Each measure was used separately as a dependent variable and each was captured in both the NHIS and the MEPS. Emergency department visits were coded in binary fashion as one for persons who had an emergency department visit over the prior year and zero for persons who did not. Most (85.3%) of the weighted sample did not visit an emergency department during the past year. Inpatient visits were rare as well, with most (92.9%) of the sample not having an inpatient visit during the past year. As the logistic regressions for these measures controlled for poverty status, self-reported health, and health insurance coverage, these two utilization outcomes can be considered measures of the severity of health conditions.

#### Demographic variables

The following demographic variables were included: poverty status, gender, age, race/ethnicity, education, family structure, region, and health insurance coverage. Poverty was measured using the official poverty measure and was categorized into four groups within the NHIS and MEPS: In poverty, low income (100–200% of the federal poverty line (FPL), middle income (200–400% FPL), and high income (>=400% FPL). Age was categorized into four groups: 18–34, 35–44, 45–64, 65–84, and 85 and older. Race included Hispanic, non-Hispanic White, non-Hispanic Black, and non-Hispanic Other. Education included three categories: Less than high school, high school graduate or General Education Degree recipient, and more than high school. Family structure included the following four types: one adult, no children; multiple adults, no children; one adult, child(ren); multiple adults, child(ren). Health insurance types included private, public only or none. Region included Northeast, Midwest, South and West.

#### Analytical plan

Descriptive and multivariate analyses were conducted using Stata MP/14. All analyses were weighted using weights developed for linked MEPS-NHIS data, to account for sampling and non-linkable biases. For the multivariate analysis, any cases with missing values were dropped from the analyses.

Two sets of multivariate analyses were conducted. First,

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