Food Insecurity and Chronic Disease: Addressing Food Access as a Healthcare Issue

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ABSTRACT

Food insecurity, or lack of access to nutritionally adequate food, affects millions of US households every year. Food insecure individuals face disproportionately higher rates of chronic diseases, like diabetes mellitus and HIV/AIDS, and therefore accrue more healthcare costs. This puts into motion a cycle of disease and expense that furthers disparities between food secure and insecure patients. Our aim is to provide an overview of food insecurity, define its link to chronic disease and offer practical solutions for addressing this growing problem.

KEYWORDS: food insecurity, chronic disease, clinical nutrition, hunger-obesity paradox

INTRODUCTION

Food insecurity, defined by the United Nations Subcommittee on Nutrition, is "the limited or uncertain availability of nutritionally adequate, safe foods or the inability to acquire personally acceptable foods in socially acceptable ways."[1] Food insecurity affects 15.8 million (12.7%) of US households. These numbers vary by region and state: the latest data averaged from the years 2013–15 reveal that the prevalence of food insecurity in Rhode Island is 11.8%.[2]

The millions of individuals in the US facing food insecurity must worry about food running out, having to skip meals or go entire days without eating. Research has shown that in addition to the significant psychological distress this creates in homes, food insecure individuals face disproportionate rates of chronic medical conditions, such as obesity, diabetes, cardiovascular disease and HIV/AIDS.

DEFINING AND ASSESSING FOOD INSECURITY

"Food insecurity" is distinct from hunger. The United States Department of Agriculture (USDA) defines the latter as a physiologic condition that occurs at the individual level.[3] Food insecurity, on the other hand, occurs at a household level. Given the many factors that weigh on a household's ability to procure and prepare food, assessments of food insecurity can be difficult. The USDA has prepared a questionnaire (US Household Food Security Survey Module) that stratifies food security into the following groups: food secure, low food security and very low food security.

The instrument importantly takes into account the presence of children in the home. Data from the September 2015 questionnaire (the most recent for which data is available) show that rates of food insecurity are substantially higher in households headed by single men or women with children. Furthermore, 59% of food insecure households reported use of federal nutrition assistance programs, such as Supplemental Nutrition Assistance Program (SNAP), Women, Infants, and Children (WIC) and the National School Lunch Program.[2] Though not without its drawbacks, the questionnaire is critical for providing statistical information on food insecurity to policymakers who determine funding of these assistance programs.

CAUSES OF FOOD INSECURITY

The causes of food insecurity are numerous. In a 2016 survey of respondents from 32 cities in 24 states, the following were listed as primary factors in food insecurity:

- Un- or underemployment
- High housing costs
- Poverty
- Lack of access to SNAP/food assistance programs
- Medical or health costs[4]

These causes also affect those living in rural areas, often to a greater degree: rates of un- and underemployment are higher in rural areas and educational attainment is lower when compared to urban and suburban areas.[5]

Based on our own clinical experience, we add that elderly individuals, college students and those without access to reliable transportation are also at risk for food insecurity. Among all these causes, we wish to highlight the cyclical relationship between food insecurity and medical costs. Food insecurity is associated with significantly greater annualized health care expenditures: on average, food insecure individuals spend $1,800 more annually on medical costs than their food secure counterparts.[6]

HUNGER-OBESITY PARADOX

Food researchers have consistently demonstrated that food insecure individuals are overweight, a phenomenon known

at the "hunger-obesity paradox."[7] Among studies that have been done to elucidate this is one involving over 450 patients at a community health center in Chelsea, Mass. Researchers followed these patients for three years. In those who self-reported food insecurity, body mass index (BMI) increased an average of 0.15 per year.[8]

To broaden the scope from obesity to overall health, researchers in the Mississippi Delta surveyed over 1,400 participants and found that food insecure individuals were more likely to rate their health (measured broadly in terms of physical and mental functioning, energy, pain and mood) as poor or fair.[9]

There are many theories that attempt to explain the obesity paradox, but one that deserves to be expanded upon is the prevalence of low-cost, energy dense "convenience" foods in impoverished areas. An influential study done in France, using food cost data from the late 1980s and early 90s, demonstrated that each additional 100 grams of fats/sweets reduced daily diet costs on the order of 6 to 46 cents, while each additional 100 grams of vegetables and fruits raised daily diet costs by 21 to 33 cents.[10] Over weeks and months, those costs are significant.

Foods that are cheap and high in calories tend to promote overconsumption, leading to weight gain over time.[11] And with excess weight comes the risk of developing myriad medical problems.

FOOD INSECURITY AND CHRONIC DISEASE

Food insecurity has been independently implicated in the development of a number of chronic diseases that continue to overwhelm our healthcare system. Among these conditions include type 2 diabetes mellitus (DM), cardiovascular disease, HIV/AIDS and mood disorders.

In regards to diabetes and heart disease, the role of food in both conditions is complex. As we have shown, obesity, which itself is a risk factor for diabetes and heart disease, is more prevalent in food insecure individuals.

Even after adjusting for sociodemographic factors and physical activity level, people with severe food insecurity are more likely to have type 2 DM than those without food insecurity.[12] Blood sugar control over time, assessed by measuring hemoglobin A1C, is worse in food insecure individuals, possibly due to their inability to afford and follow a diabetic diet that limits processed foods like simple carbohydrates.[13]

When one considers the first step in addressing diabetes after diagnosis is lifestyle intervention, it becomes clear that these fall short when patients lack access to nutritious food. Instead, many of these patients end up being prescribed medications and eventually insulin, adding to their healthcare costs and cutting into their overall income. This perpetuates the aforementioned cycle of food insecurity and chronic disease.

It is striking that some disease states, such as HIV/AIDS, which are not related to obesity in the same way as diabetes and heart disease, are also related to food insecurity. A study of over 400 people living in North Carolina revealed a higher rate of HIV infection in food insecure individuals regardless of high-risk sexual behavior.[14] Among theories offered to account for this include the fact that patients are less likely to adhere to HIV therapy when food insecure and, even when they are adherent, absorption of protease inhibitors is limited when taken on an empty stomach.[15,16]

IDENTIFYING AND RESPONDING TO FOOD INSECURITY

With an abundance of data on food insecurity as it relates to chronic disease and health care expenditures, there is urgency in identifying those at risk for food insecurity and intervening early. The American Academy of Pediatrics (AAP) suggests using two questions from the USDA food security survey to accomplish this:

Within the past 12 months, we worried whether our food would run out before we got money to buy more.

Within the past 12 months, the food we bought just didn't last and we didn't have money to get more.

Respondents choose often true, sometimes true, never true, or don't know. Those who respond often true or sometimes true to either statement have a high likelihood of being food insecure.17 Once identified, food insecurity can be appropriately addressed by healthcare providers through referrals to food assistance programs at the local and national levels.

THE ROLE OF THE HEALTHCARE PROVIDER

We propose that healthcare providers should ask all patients, regardless of age, the two questions above. Alternatively, these questions could be targeted to those at increased risk for food insecurity, including individuals of low socioeconomic status, the elderly and those with limited access to reliable transportation. Providers with access to social workers should refer food insecure patients to social work services or direct patients to local food banks found online or by dialing 211, a nationwide number for community resources and referrals.

CONCLUSION

Individuals living without access to nutritious food are at disproportionate risk of developing chronic diseases, from diabetes to HIV/AIDS to mood disorders. Treatment of these conditions cuts away at their income and leaves them in a vicious cycle of inexpensive, nutritionally poor foods and health crises. Physician involvement in identifying and reducing food insecurity probably improves health outcomes and decreases health-related costs.

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