Food and Nutrition Security in Clinical Settings

by Bong Nguyen, PhD & Betty M. Drees, MD

Food insecurity is a social determinant of health that has one of the largest impacts on individuals' overall health.

Abstract

Food insecurity affects fourteen million American households. Due to the impact on health outcomes and costs of care, food insecurity is one of the leading health and nutrition issues in the U.S. In this article, we provide an overview of food and nutrition insecurity and how it is measured, followed by health consequences of food insecurity, and then discuss ways that physicians and health professionals can help address food and nutrition security in clinical setting.

Introduction

The relationship between food and health has been recognized for over 2,000 years, at least since the time of the ancient Greeks, including Hippocrates. The popular phrase ascribed to Hippocrates (400BC) "let thy food be thy medicine and medicine by thy food" is used to emphasize the importance of nutrition to prevent and cure disease, which includes access to food. Lack of access to nutritious food, referred to as food and nutrition insecurity, is still very relevant today due to the impact on health outcomes in chronic disease and costs of care. In 2019, almost 14 million households in the U.S. (10.5%) were food insecure.[1] Among those, more than five million households were at a more serious level known as very low food insecurity.[1]

Among various social determinants of health, food insecurity has one of the largest impacts on individuals' overall health. It can have significant short- and long-term consequences, such as malnutrition, obesity, and chronic diseases. Individuals who report being food insecure are at higher risk of developing obesity, diabetes, hypertension, cardiovascular disease, stroke, cancer, and associated conditions. The burden of food insecurity is not borne equally across all populations. Within the U.S. population, food insecurity is more likely to occur in households with income near or below the federal poverty line, low education levels (less than high school), in households with children, and in Black and Hispanic households.[1]

Individuals with food insecurity experience higher health care costs than food secure individuals. In the U.S., annual health care expenditures of adults with food insecurity were almost $2,000 higher than the costs of food secure adults.[2] For older adults, on average, food insecurity adds approximately 11% to the health care costs, with or without a specific chronic condition.[3] In addition, food insecurity has been associated with delaying medical care, the timely and adequate intake of medications, and higher levels of service use such as emergency department visits and hospitalizations.[4] It is therefore important for health professionals

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to understand negative health and nutrition outcomes resulting from food insecurity and the challenges experienced by food insecure individuals, in order to become more sensitive to patients' needs and adapt the treatment and services accordingly.

Food and Nutrition Security

The Food and Agriculture Organization (FAO) defines food security as "when all people, at all times, have physical, social, and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life".[5] In the contrast, a person is food insecure when they lack regular access to enough safe and nutritious foods for normal growth and development and an active and healthy life. This definition is the current widely accepted definition of food security and embraces both food security and nutrition security, which emphasizes access, availability and affordability of nutritious foods, coupled with a sanitary environment and adequate health services and care to promote well-being, prevent or treat disease, not just foods that provide calories.

Based on this definition from FAO, food security comprises four key elements: availability, accessibility, utilization, and stability. Availability refers to the physical existence of food, which includes food production, commercial food imports and exports, food aid, and domestic food stocks. Food access is ensured when all households have enough resources to obtain food in sufficient quantity, quality, and diversity for a nutritious diet. In other words, it depends on whether consumers have adequate resources to purchase the food they require, which depends upon factors such as household income, food prices, employment opportunity and working resources. Adequate food supply does not guarantee food security at the household or individual level because lack of access to food is often more problematic than availability. Utilization refers to the capacity of the human body to absorb or utilize safe and nutritious food, which depends on the quantity, quality, and diversity of food consumed as well as adequate health care and sanitation services. Food utilization also includes good practices on food processing, storage, preparation, and distribution. Finally, stability is linked to the vulnerability context and risk factors that can negatively impact food availability or accessibility. It is given when food supply remains constant during the year or in the long-term and households have income and economic resources to purchase the food they require. To achieve food security, all four elements must be fulfilled simultaneously.

Food security also cannot be achieved without nutrition security, and vice versa. Sound nutrition requires not only enough energy for everyone, but also a diversity of macronutrients and micronutrients to ensure good health and prevention from diseases. On the other hand, food insecurity can be linked with nutrition security, as food insecure households may sacrifice food quality or variety in favor of food quantity, such as consuming low-cost, energy-dense foods in substitution of nutrient-dense foods.[6] This results in nutrition insecurity in presence of excess calories and lack of essential nutrients. It has been recommended by experts to use the term "food and nutrition security" which embraces both concepts to emphasize the food and health requirements for individuals.[7] In this paper, the term "food insecurity" that we use in our discussion below refers to both food and nutrition security.

Food Insecurity, Health, and Nutrition Outcomes

Dietary Behaviors and Overweight/Obesity

Several studies have shown that food insecure individuals have lower nutrient intakes, and diet quality while having increased fat and sugar intakes. For example, American adults experiencing food insecurity eat fewer vegetables, fruit, and dairy products and have lower intake of vitamins A and B6, calcium, magnesium, and zinc.[8] Among children, an adverse association between food insecurity and fruit consumption was consistently observed.[8] In addition, food insecure children consume more cheaper foods with high fat or sugar, compared to food secure children.[9] Quality of diet is also reported to be low among young adult population. For example, food insecure college students have significantly lower intakes of fruit, vegetables, and fiber while having higher intake of total added sugar than food secure students.[10]

A reason to explain the relationship between food insecurity and poor quality diet is that healthy food is perceived to be higher cost whereas refined grains, added sugars, and fats are generally inexpensive, palatable, and readily available in low-income communities.[11,12] Food insecure households and individuals often try to stretch their food budgets by purchasing cheap, energy-dense foods, which typically have lower nutritional quality.[13] Moreover, low-income communities may be limited to shopping at small

neighborhood convenience and corner stores where fresh produce and low-fat products are limited; whereas fast food restaurants, which serve many energy-dense, nutrient poor foods at relatively low costs, are largely available in these communities.[14-16] In addition, healthy food, especially fresh fruits and vegetables when available in low-income neighborhoods, was often of poorer quality and was not appealing to customers.[17] Thus, individuals in these neighborhoods were less likely to buy the healthier food.

As a consequence of poor-quality diet, overweight and/or obesity is prevalent among food insecure individuals. In fact, researchers have demonstrated the coexistence of food insecurity and obesity in the same individual, family, or community. One in three American adults with food insecurity are obese, especially among women.[18] For children, research studies show mixed results about the association between food insecurity and obesity. For example, a review of 20 cross-sectional and longitudinal studies was conducted to examine the relationship between food security and weight status among children and adolescents in the U.S.[19] Findings of this review showed that majority of the studies (nine out of 20 studies) included in the review did not show significant association, while six studies showed more weight gain and higher body mass index among food-insecure children. A small number of studies in this review (n = 5) even suggested that food-insecure children were less likely to have obesity compared to food-secure peers. Additional studies are encouraged to fully understand the relationship between food insecurity and weight gain and obesity among children.

Food Insecurity and Chronic Diseases

Research has demonstrated that individuals with low and very low food security are more likely to have chronic diseases and conditions, such as diabetes and high blood pressure. For instance, the prevalence of diabetes mellitus among American adults with low and very low food security is approximately two times higher than the rate among food secure adults.[20] In addition, individuals with food insecurity are two times more likely to have higher diastolic blood pressure, compared to those without food insecurity.[20] Older adults experiencing food insecurity are more likely to have multiple chronic conditions, including asthma, chronic bronchitis or COPD, chronic pain, diabetes, kidney disease, and a sleep disorder than food secure counterparts.[20] The association between food insecurity and multiple chronic conditions among these older adults was significant even after adjusting for educational level, household income, employment status, and other socio-demographic factors.[21]

Among children, food insecurity might negatively affect their acute and chronic health conditions in both direct and indirect ways. As mentioned previously, food insecure individuals and households are likely to have poor diets or disrupted eating patterns, which may lead to poor weight outcomes and increased risk of chronic conditions, such as diabetes and heart diseases.[22,23] Moreover, children living in food-insecure households are at higher risk for mental stress and depression, which might impact immune functioning, thus leading to more acute and chronic health conditions.[24] An analysis of data from the 2007-2014 National Health and Nutrition Examination Survey (NHANES) showed that children and adolescents living in food insecure households had 1.26 times higher risk of having high blood pressure than those who are food secure.[25] Assistance programs and policies are needed to address food insecurity among children and adults to protect health and prevent health issues and diseases.

Supporting Food Insecure Patients in Clinical Settings

Physicians and other health professionals can help improve the health and nutritional status of patients who experience food insecurity, by applying the SEARCH mnemonic (Screen, Educate, Adjust, Recognize, Connect, and Help).[26]

Screen

Screening for food insecurity among patients helps health professionals improve patient care and develop approaches to support patients manage their conditions well. Screening for food insecurity in health care setting is highly accepted among patients. For example, most patients (~84%) in a study reported high levels of acceptability about food insecurity screening and stated that it was valuable in the primary care setting.[26] However, few physician practices and hospitals screen for food insecurity. In a cross-sectional study with approximately 3,000 physician practices and hospitals in the U.S., Fraze and colleagues found that the majority of the physician practices and hospitals (70.4%) did not report screening patients for food insecurity.[27]

The USDA developed an 18-item survey to measure food insecurity during the previous 12

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months.[28] Even though the 18-item survey was preferred to screen for food insecurity, a two-item screening tool was used to quickly assess food security status.[29] Individuals have food insecurity if they answer "often true" or "sometimes true" to either of the two following statements: 1) Within the past 12 months, I/we worried whether my/our food would run out before I/we got money to buy more; 2) within the past 12 months, the food I/we bought just didn't last and I/we didn't have money to get more. Patients should be screened for food security during the intake process so that health professionals and physicians can tailor their treatment to improve the health of patients.

Education

Food insecure individuals and households used several ways to cope with their food insecurity. Many food insecure individuals used food-based coping strategies, such as eating less preferred foods or cutting down portion size, stretching or diluting food and beverages, fasting or skipping meals, eating excessive amounts of high-calorie foods when food is available.[30,31] In addition to food-based strategies, individuals and families utilize money-saving and trade-off techniques to cope with their food insecurity situation. These techniques include purchasing only very basic necessities, forgoing purchases of clothes and shoes, not going out for entertainment, dispensing with phone services, using less electricity for light and air conditioning, and cutting down on food consumption.[6] Some families receive donations such as non-perishable foods, clothing, and monetary assistance from relatives and community organizations.[6] Moreover, approximately one in three food insecure individuals are often faced with a difficult choice to pay for food or medication; they often skip food for medications or deny to purchase/refill medications to be able to buy foods.[32] This strategy greatly challenges the success of chronic disease management.

Understanding strategies used by food insecure patients help clinicians in educating the patients on appropriate coping strategies. However, in clinical setting, much of the counseling on dietary changes is to increase healthy and nutrient-dense foods like fresh fruit and vegetables, which is implausible as these foods are the least affordable foods for patients with food insecurity.[33] Instead, providers should counsel patients to eat healthy foods on a limited budget and learn portion sizes like minimizing large amounts of energy-dense foods in favor of smaller portions of nutrient-

dense foods. For patients with diabetes, it is important that physicians teach the patients mindful eating, avoid eating excessive amounts of foods when food is available and then prolonged fasting because this behavior can cause hyper- or hypo-glycemia.[34] For patients with hypertension, physicians should educate about sodium restriction because sodium is often high in prepacked food or low-cost fast foods. In addition, physicians and other health professionals can educate and help engage the patients to state and local benefit programs to help reduce the burden of food insecurity and their competing choices between foods and medications or treatment.

Adjust

Identifying patients with food insecurity helps physicians adjust the patients' use of medication if it should be taken with food. For example, as food insecure patients are likely to skip meals, physicians can prescribe medications that are less likely to cause hypoglycemia, such as metformin, and schedule medication taking with meals instead of time of day.[34] In addition, physicians can teach patients to alter medications when dietary intake is low or absent.[35] Prescribing medications that are effective yet affordable is of the essence for food insecure patients.

Recognize

Physicians need to understand that food insecurity is a recurrent condition – it can be long term or temporary;[36] therefore, patients should be screened at every visit to help ensure appropriate evaluation of food insecurity. New situations may arise, such as loss of employment or the current coronavirus pandemic that affect income and food access. In addition, screening for food insecurity and recording into the medical record would enable physicians and other health professionals to address food insecurity as an ongoing issue in medical care.

Connect

Connect patients with healthy food access by referring resources that are available in the clinic, community, or federal assistance programs. These resources might include:

- Local food banks and food pantries
- Social assistance programs: Supplemental Nutrition Assistance Program (SNAP); Temporary Assistance for Needy Families (TANF); Women, Infants, and Children (WIC)
- Home-delivered meals: Meals on Wheels
- Organizations providing free or low-cost meals and other supplemental food programs: summer, afterschool, and weekend meal and supplemental food programs
- Find Food Support site (https://findfoodsupport.withgoogle.com/) includes a Google Maps locator for finding the nearest food bank, food pantry or school lunch program pickup site. The site also includes a SNAP benefits search feature that provides information on national and state eligibility requirements and additional food support resources for specific populations, such as seniors, families with children, and military families.

Connecting patients with these programs and resources not only enables food access but also help patients reduce their competing choices between foods and medications or treatment. To make it sustainable, hospitals should develop an accessible and reliable database of the local resources to share with their patients.

Help

Many health professionals perceived food insecurity as "normal" for some patients and not something they need to change their clinical practice to address.[37] They are also uncertain to raise the food insecurity issue with their patients due to the fear of offense. This suggests a need for support to help health professionals recognize the relationship between poor health and food insecurity and better understand the challenges of food insecurity experienced by their patients, especially those with long-term health conditions. Programs for research and development should also be implemented to ensure health systems foster good professional practice in food insecurity area.

Conclusion

Food insecurity is a social determinant of health that has one of the largest impacts on individuals' overall health. It affects one in 10 American households and should be considered in any population health strategy and in treating individuals with chronic disease. Health professionals need to understand the relationship between food insecurity and poor health outcomes and the challenges experienced by food insecure individuals. This helps health professionals become more sensitive to patients' needs and adapt the treatment and services accordingly, in order to improve the control and management of health conditions of

patients. This relationship between food and health was recognized in the ancient practice of medicine and is still just as true and relevant in modern medicine.

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