

Food Insecurity: Disparities, Risk Factors, and the Adverse Effects on Health Outcomes

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HN-300-C: Honors Capstone

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May 5, 2022

Why is Food Important?

Eat a Snickers. You're not you when you're hungry. No one is. Food is fuel, and we need it to survive. The famous American psychologist Maslow proposed this idea of a 5-level hierarchy of human needs and believed that those needs expressed at the bottom of the pyramid must be met before individuals can attend to the needs higher up on the pyramid. The top of the pyramid showcases needs such as self-actualization, possessing self-esteem, status, recognition, strength, and freedom, while at the bottom of the pyramid sits physiological needs including air, water, shelter, sleep, clothing and of course, food. This philosophical construct supports what we all already know, which is that food is essential to survival. Food provides nutrients which help provide us with the energy we need for activity and growth. Without the nutrients provided by food, we would not be able to carry out the bodily functions necessary to keep us alive and our bodies would not have the nutrients needed to grow and repair or to keep our immune system healthy which is vital to helping us fight infections and other illnesses and ailments. According to the U.S. Department of Agriculture, a person can be considered food insecure if they are unable to reach a nutritional target of 2100 calories per day which is the recommended caloric intake in order to sustain a healthy and active lifestyle ("Understanding Food Insecurity, 2022). A person or entire household can be considered food insecure for a temporary amount of time or individuals or households can sustain food insecurity for an extensive period of time. Experiencing food insecurity for too long, however, can be detrimental to one's health so it is important to look at the different risk factors that can lead to food insecurity as well as the demographics of people who typically experience food insecurity in order to prevent the adverse outcomes associated with such conditions.

Thesis Statement

Food insecurity is a complex, multifaceted issue that affects millions and millions of people across the globe. It is an overwhelming issue with many different direct and indirect causes that are associated with increasing the likelihood that an individual or household may experience food insecurity at some point in their life. Food insecurity in America is most heavily influenced by poverty and other social determinants of health, and it has seriously adverse effects on the health outcomes of those who experience it. Although there are effective programs in place to work towards alleviating the issue of food insecurity, it is important to continue research as to untangle the complexity of this issue in hopes of defining a more direct relationship between food insecurity and a particular cause. Such findings may help facilitate a solution that could eliminate the issue of food insecurity.

What is Food Insecurity?

Food insecurity can be defined in a multitude of ways, and each different definition provides a greater insight into the many ways food insecurity can be experienced. The U.S. Department of Agriculture defines food insecurity as a lack of consistent access to enough food for an active, healthy life (“Understanding Food Insecurity”, 2022). Food insecurity can also be defined as the “limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways (e.g. without resorting to emergency food supplies, scavenging, stealing or other coping strategies)” (Cook et. Al, 2004) Both of these definitions highlight the fundamental lack of food and nutrients that characterizes food insecurity. Food insecurity is one way we can measure how many people cannot afford food. Food insecurity, as shown by the second definition, can also encompass the means by which people are able to obtain food and whether or not there is adequate and

reasonable access to nutritional food. This concept of food insecurity lends itself to the defining of two other important situations that relate to food insecurity which are food deserts and food mirages, as they are often associated or connected to food insecure populations. Food deserts are areas in which there is little to no access to good quality fresh food including fruits and vegetables and other nutrient dense foods. Food deserts are often located in urban areas, though they can exist in rural areas too, where the only affordable food available is found in convenience stores or local markets. Something that can be even more dangerous than a food desert, due to its extremely misleading nature, is a food mirage. A food mirage is an area in which there is one grocery store or plenty of grocery stores that have quality nutrient-dense foods including fruits and vegetables, however, these healthful items cannot be afforded by the populations in the neighborhood. That store is rendered useless when no one in the surrounding area has the means to afford the expensively priced food inside. For example, a food mirage would be when there is a Whole Foods or another expensive grocery store in a low-income neighborhood like Bridgeport. From the outside it may seem like there is improved access to food for the nearby population but that only holds true when the population also has the economic means to afford such food. Food security is a continuum and there are four main levels of food security as defined by the U.S. Department of Agriculture: high food security, marginal food security, low food security, and very low food security (“Understanding Food Insecurity”, 2022).

Risk Factors & Demographics Associated with Food Insecurity

Food insecurity is a rather complex issue which many different factors that can contribute to one’s likelihood of suffering from food insecurity. However, after a great deal of research I narrowed it down to what I believe the three most influential risk factors are for experiencing

food insecurity. I found the most commonly discussed and most significant factors contributing to food insecurity include poverty, unemployment, and low-income status, a lack of reliable or affordable housing, and systemic racism & racial discrimination. Despite these main three factors that greatly contribute to food insecurity, overall, there are many factors often referred to social determinants of health. Social determinants of health are defined as “the conditions in the environments in which people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning, and quality-of-life outcomes and risks” including “lack of affordable housing, social isolation, economic and social disadvantages resulting from structural racism, chronic or acute health problems, high medical costs, and low wages” (Flores, 2021). These social determinants of health convey a more all-inclusive approach to defining the many different risk factors that exist when discussing food insecurity and help to highlight the interconnected relationship amongst them all.

Food insecurity is most associated with poverty. The poverty line for a family of four is \$25,100 (“Food Insecurity and Poverty, 2018). However, food insecurity can be experienced by those above the poverty line as well. Despite the rise in wealth, there are still record numbers of Americans experiencing food insecurity today. “Income-based measures of impoverishment mask experiences with material deprivation that are widespread and transcend the standard thresholds that define poverty” (Briggs et. al, 2010). Even in light of the extensive research showing a correlation between unemployment, poverty, and food insecurity it is important to remember there are many other factors that remain at play when influencing one’s likelihood of experiencing food insecurity.

In 2022, 42 million people in America are projected to experience food insecurity (“Food Insecurity and Poverty”, 2022). To help conceptualize this number, an average NFL football

stadium holds about 60,000 to 70,000 spectators. This means that it would take over 600 football stadiums to hold all of those people who have been projected to experience food insecurity in 2022. Of this 42 million 13 million are projected to be children which means 1 and 6 children are estimated to experience food insecurity in 2022 (“Food Insecurity and Poverty”, 2022).

Significant disparities exist by race, geography, and income-status when talking about populations that experience food insecurity. Through a great deal of research, it was found that non-white racial and ethnic groups experience food insecurity at disproportionate rates when compared to their white peers. The statistics are rather disheartening and highlight an issue that is compounded by structural racism and severe economic inequality which will take further research to develop a more thorough understanding of why that is and this relationship that exists between race and ethnicity and food insecurity. In 2022, it is projected that one in twelve white households will experience food insecurity, while one in six Latino households and one in five African American households are expected to experience food insecurity (Frongillo, 2008). Once again it can be seen how black and Latino individuals experience food insecurity at disproportionate rates when compared to their white counterparts year after year. The likelihood of experiencing food insecurity also varies based on one’s geographical location. Those living in rural communities would experience a greater incidence of food insecurity than those living in urban communities, however, the projected rates of food insecurity by geography did not reflect as much of a difference as expected. Only 13.3% of rural populations were expected to experience food insecurity while 12.1% of urban population were projected to experience food insecurity.

Despite all of these risk factors and despite the many populations that are at an increased risk of experiencing food insecurity, there previously was a downward trend in food insecurity

from 2011 to March of 2020 (Flores, 2021). The pandemic has had an amplifying effect on the factors that contribute to and the implications of food insecurity, and it has essentially reversed any and all progress being made towards lessening the incidence of food insecurity not only in America but also worldwide.

Health Outcomes Affected by Food Insecurity

Food insecurity is associated with an overwhelming amount of adverse outcomes in regard to physical and mental health in addition to one's behaviors. There is an overwhelming amount of research that connects food insecurity with adverse health outcomes as the issue of food insecurity means one is experiencing a lack of nutrition, and nutrients deficiencies can ultimately have fatal effects if food insecurity is endured for extended periods of time. The effects of food insecurity can be not only physical but also mental and even have implications on people's levels of motivation and children's performance in the classroom. In general, food insecurity is associated with increased risks of birth defects, anemia, cognitive problems, and aggression, and anxiety (Gundersen & Ziliak, 2015). Food insecurity is also associated with increased risks of being hospitalized, having asthma, behavioral problems, depression, and suicidal ideation, in addition to having worse oral health, and overall poorer general health (Gundersen & Ziliak, 2015). The aforementioned examples are rather broad and highlight the vast number of adverse outcomes associated with food insecurity. The following highlighted research will work to demonstrate some more specific examples of how food insecurity has been seen to cause negative outcomes in those who experience it, especially those who have to endure food insecurity for extended periods of time.

Although all age populations can experience adverse effects on account of food insecurity, food insecurity in children is of even more concern as there overall health and well-

being are significantly impacted by a lack of food during such primitive developmental years. Food insecurity in children can result in poor cognitive development, socio-emotional development, and health outcomes according to Briggs et. al (2010). Even temporary instances of food insecurity are related to lower cognitive development outcomes among toddlers, which often lends itself to lower math and reading comprehension in school-aged children as well as a greater likelihood of having to repeat a grade down the road in school (Briggs et. al, 2010). In a study conducted by Briggs et. al, a likely link between food insecurity and poor developmental outcomes was revealed; this link being a lack of iron (2019). Iron is a vital nutrient that is often consumed through food. It aids in normal learning and cognitive function, and if someone is experiencing an iron deficiency, one is likely to experience greater tiredness, weakness, low levels of energy and memory problems as compared to those who are not suffering from iron deficiencies (Briggs et. al, 2010). Although there isn't as clear of link between food insecurity and socio-emotional development, there are still observable patterns that suggest a causal relationship between the two. Briggs et al. found that, "food insecurity in children is associated with increased psychosocial dysfunction, internalizing behaviors, poor social skills, less positive behavior, more aggression and destructive behaviors, and withdrawn and distressed behaviors" (2019). There was also a correlation between food insecurity and increased psychologist visits, school-suspension among school-aged children, and depressive disorders, the latter being specifically among fifteen- to sixteen-year-olds (Briggs et. al, 2010). Not only is there clear psychological implications for children experiencing food insecurity but there are also physical outcomes that are adversely affected by a lack of access to food which characterizes food insecurity. Overall, food insecure children experience poor health including a higher likelihood of being hospitalized, lower physical function, and more chronic health conditions than those

children who are a part of households deemed food secure (Briggs et. al, 2010). One physical health outcome which does not have as much of a clearly defined relationship is food insecurity and weight status. This is likely due to the issue food insecure parents have to face which is feeding their kids junk or nothing at all, and they will of course choose junk, i.e. non-nutritional foods high in sugar, salt, and fats, versus not feeding their children at all. This dilemma leads to higher numbers of children in the overweight status that are suffering from food insecurity, yet there is also research that presents opposite findings which reveals that food-insecure children are less likely to be overweight than food-secure children (Briggs et. al, 2010).

While the adverse health outcomes of children who experience food insecurity are much thoroughly researched, there has been some studying down that looks at adverse health outcomes associated with adult and senior populations who experience food insecurity. These outcomes are broader and focus much more on physical and mental well-being whereas food insecurity in children produces adverse outcomes more associated with development and psychological functioning in addition to physical health of course. Some of the adverse health outcomes for adults include, “decreased nutrient levels, increased rates of depression and anxiety, diabetes, hypertension, hyperlipidemia, worse outcomes on health exams, poor sleep outcomes, and a greater likelihood of difficulty executing activities of daily living” when compared to their food secure peers (Gundersen & Ziliak 2010). Although there are many factors that contribute to such negative health outcomes, there is a possible mechanism by which food insecurity more directly leads to something like diabetes. Similar to how a connection was made between food insecurity, iron deficiencies, and poor educational outcomes, a connection can be made between a decreased nutrient intake caused by food insecurity and diabetes. Diabetes can be very heavily influenced by one’s diet, and food insecurity, which often leads to more stress and therefore increases in

cortisol, contribute to central adiposity which is often associated with diabetes (Gundersen & Ziliak, 2010).

Likely with more research, more mechanisms can be identified that better explain the relationship between food insecurity and negative health outcomes. The biggest issue is that food insecurity means one is experiencing a nutrient deficiency as this nutrient deficiency is what often causes the multitude of health problems associated with food insecurity. Time and time again there is plenty of research that shows the way in which food insecurity has a negative association with health outcomes across all age groups and demographics.

Efforts to Address Food Insecurity

Part of what makes food insecurity such a difficult problem to solve is the plethora and complexity of the underlying causes and risk factors. These causes and factors including poverty, unemployment, lack of education, unreliable housing, chronic medical conditions, system barriers, and so many more are often deeply interconnected. These factors culminate to form a great deal of stress placed on a household and individuals that can only exacerbate the issue of food insecurity. There are a multitude of government programs that aim to alleviate many of the risk factors associated with poverty and unemployment, but there also a great deal of programs that work to address the issue of food insecurity more directly. The government aids families experiencing food insecurity through different programs ranging from breakfast and lunch for school children to nutrition programs for women, children, and infants. Those food assistance programs include the Supplemental Nutrition Assistance Program (SNAP), Women, Infants, and Children (WIC) program, National School Lunch Program (NSLP), and the School Breakfast Program. America's largest food and nutrition assistance program is the Supplemental Nutrition Assistance Program (SNAP), which is more commonly known or referred to as food stamps.

SNAP is the largest anti-hunger program, and in 2020 alone, 55% of food insecure households participated in either SNAP or one of the other main federal nutrition assistance programs.

SNAP works to ensure low-income households are able to afford more health foods (“Food Insecurity and Poverty”, 2022). WIC serves low-income pregnant, postpartum, and breastfeeding woman, infants, and children up to age five who are at risk of not being able to access food. WIC is an important program as it also provides nutritional food, information on healthy eating, and referrals to health care, so not only does it address the issue of food insecurity, but it also works to address the adverse health outcomes associated with food insecurity. The NSLP is another government child nutrition program. It is a federally assisted meal program operating in public and non-profit private schools as well as residential childcare facilities. It works to provide nutritionally balanced, low-cost or free lunches to children each school day. There are several other federal food assistance programs that aim to support high-risk communities to prevent food insecurity and hunger including the Food and Nutrition Service (FNS), the Emergency Food Assistance Program, USDA National Hunger Clearinghouse, and more.

Another intervention program that works to alleviate food insecurity is the Seniors Farmers’ Market Nutrition Program (SFMNP) (“Seniors Farmers’ Market Nutrition Programs”, 2022). This program serves over 800,000 low-income seniors across the 27 states that participate in this program, and the goal is to provide these low-income seniors with access to locally grown fruit, vegetables, honey, and herbs (“Seniors Farmers’ Market Nutrition Programs”, 2022). Seeing as though seniors are one of the communities that experience increased rates of food insecurity, programs like this are very beneficial to ensuring they have access to low cost, nutritional food.

An article by Holley and Mason (2019), presented an extremely thorough review of the efficacy of the implementation and evaluation of different intervention strategies that aim to tackle food insecurity in children. It looked at different intervention programs including school food assistance programs, nutrition education programs, and subsidy intervention programs which include the Women, Infants and Children intervention and Supplemental Nutrition Assistance program. Assessing the effectiveness of these programs that aim to alleviate food insecurity is important as it can reveal not only their ability to accomplish the aforementioned goal, but it can also help to assess what offer positive effects may be associated with such programs. When looking at the effectiveness of school food assistance programs, it was found that they can significantly improve educational difficulties, including a lack of concentration and motivation and decreased attendance, that are commonly associated with food insecurity (Holley & Mason, 2019). Similarly, food-insecure participants in the School Breakfast Program and National School Lunch Program were found to have decreased rates of obesity when compared to non-participating food-insecure girls (Holley & Mason, 2019). This finding likely relates to the idea that such assistance programs strive to produce students with nutritional, balanced meals, compared to those non-participants who may have no chance but to eat a candy bar or something else with little nutritional value for breakfast. When assessing the effectiveness of the SNAP intervention program, one of the most extensively researched and evaluated programs, Holley and Mason found that, “in terms of education attainment, participation has been found to improve children’s mathematics and reading scores... and in terms of health outcomes, the evidence suggests that participation reduces poor health among food-insecure children” (2019). This is a very important finding as it highlights the success of the SNAP program in addressing the adverse effects of food insecurity in children. A more direct relationship between food

insecurity was found, as Holley and Mason explain that participation in SNAP is associated with decreased odds of child food insecurity among a general US population (2019). A similar conclusion was reached in regard to WIC as well. The WIC intervention program was found to reduce the prevalence of child food insecurity and to decrease probability of infants being underweight or of poor health, two outcomes associated with food insecurity, as well as ensuring lower odds of poorer health status and being overweight in participating children compared to eligible non-participating children (Holley & Mason, 2019).

In addition to these government policies and programs that contribute to anti-hunger efforts in America, it is also vital to include charity organizations and non-profits that work to compensate when government programs fail to meet the needs of certain communities. One prime example of that was most recently during the COVID-19 pandemic. During 2020, the Feeding America network distributed 6.1 billion meals, which correlates to 7.5 billion pounds of food which was a 44% increase compared to previous years (“The Impact of Coronavirus”, 2021). Efforts made by the food bankers, volunteers, and partner agencies in coalition with Feeding America helped ensure that the significantly increasing number of people suffering from food insecurity were able to access the food they so desperately needed.

Although there are a multitude of programs and organizations in place that work to address food insecurity, there is no clear solution on how to eliminate this ever-growing problem. Food insecurity is an overwhelming complex, multifaceted issue that is contributed to or caused by so many confounding factors. One of those factors being poverty, and one of the leading factors of poverty is known to be a lack of education. It would be important to look at how improving access to quality education and removing barriers to education would facilitate decreased levels of poverty and in turn lower rates of food insecurity. Although this approach is not as direct as

government anti-hunger programs, it could be a very successful way to work towards breaking the cycle of poverty and food insecurity in America, an intricate relationship that these government programs may not necessarily take into account or work to address directly as they instead focus directly on supplying food. Through research, it has been seen that these programs are effective at decreasing rates of food insecurity, however. Not only are programs an effective way to address food insecurity, but it is also important to look at how government policies that affect the funding for these programs can have an influence on food insecurity as well as how education can play a role in breaking the cycle of food insecurity. Also, government policies are an important facet to look at when considering how to address the issue of food insecurity as such policies have the power to influence the cost and distribution of food in addition to other factors that increase food insecurity such as unemployment rates and unreliable housing. By implementing policies and programs that work to both directly and indirectly lessen the incidence the food insecurity, the government could make greater strides towards eliminating this issue that affects millions and millions of Americans. Going forward more research most definitely should be done in order to untangle the complex relationship that exists amongst the determinants and risk factors associated with food insecurity, food insecurity itself, and the adverse health outcomes associated with food insecurity. Once a more definitive and thoroughly understood relationship between these things is able to be defined, methods for improvement, and hopefully one day elimination of food insecurity, can be made.

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