

# Exploring the Impacts of Food Insecurity on Patients with Cancer in Low-Income Communities

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## **ABSTRACT**

Globally, food insecurity is a growing, dire issue, which has profound impacts on cancer patients in underrepresented and low-income communities. On average, cancer patients have a 5-43% increase in the number of individuals who are food-insecure compared to the general population.(Raber et al., 2022) This increased rate of inadequate nutrition equates to lower cancer treatment adherence, increased mental burden, and higher death rates. Already financially burdened, low-income cancer patients often prioritize healthcare costs over nutrition, causing detrimental impacts to their health and treatment outcome. Addressing food insecurity is a multifaceted process that includes policy change, targeted intervention, and concentrated research. This editorial summarizes the findings from multiple sources to provide a focused insight into the impacts of food insecurity on low-income cancer patients, and recommendations for addressing this paramount matter.

## INTRODUCTION

Food insecurity, by definition, is a situation in which households have difficulty consistently obtaining sufficient food due to a lack of economic resources.(USDA ERS - Food Insecurity, Chronic Disease, and Health Among Working-Age Adults, 2017) Minority communities face the highest rates of food insecurity in the United States, with African-Americans and Hispanics facing the highest percentage of food insecurity. Studies show that almost 20% of African-American and 16% of Hispanic households face food insecurities in the United States, while notably, only 7% of White households face this issue.(Food Accessibility, Insecurity and Health Outcomes, 2024) Current trends show that food insecurity is growing globally. In 2020, nearly 15% of U.S. households were food insecure, and in 2023, almost 21.5% of the global population faced food insecurity.(Food Accessibility, Insecurity and Health Outcomes, 2024; Global Report on Food Crises (GRFC) 2024 | World Food Programme, 2024) Lack of an adequate diet can cause many chronic diseases, such as cancer, and impact how effective treatment will be for the patients.

## FINANCIAL BURDEN AND FOOD INSECURITY

Cancer amplifies the already challenging financial obstacles low-income cancer patients face. A cancer diagnosis can have profound economic implications for the patients. The average out-of-pocket cost for cancer treatment in the U.S. is \$316 to \$741 per month during active treatment.(Alzehr et al., 2022) For most, this amount is more than 20% of the patient's annual income, which is already reduced or ceased due to working less or being fired.(Alzehr et al., 2022) This financial burden puts the average cancer patient at risk for not maintaining adequate nutrition, and falling below the National Poverty Line. The downstream financial effects of a cancer diagnosis are multi-fold. First, the patient is diagnosed with cancer and is then required to pay for expensive cancer treatments while having a reduced income from taking time off work.(Alzehr et al., 2022) This then puts a financial strain on an already fraught financial situation, which causes the reallocation of finances from food to healthcare costs. This reallocation leads to food insecurity, and the effects of malnutrition and a compromised diet begin to impact health outcomes and a worsened quality of life.

### **Correlation Between Socioeconomic Status and Food Insecurity**

One of the most significant factors influencing food insecurity in cancer patients is socioeconomic status. Low-income communities have the least access to food. And as previously discussed, food insecurity is correlated with increased cancer rates in low-income communities. Additionally, being from a lower economic status confines the population or household to a lower quality of food purchased. High food quality is extremely important when it is suggested that 50% of cancer deaths are caused by neoplasms related to dietary factors.(Perera et al., 2006).

Poverty amplifies food insecurity, equating to individuals from lower socio-economic backgrounds being distinctively impacted by inadequate diets and severe cancer outcomes.

And with a cycle of high food insecurity percentages and rising cancer incidence rates, those from low-income communities are facing exacerbated health disparities.(2024 Cancer Facts & Figures Cancer | 2024--First Year the US Expects More than 2M New Cases of Cancer, 2024)

### **Spatial Disparities in Food Access**

Where a person is located is another critical influencer in the severity of food insecurity because it determines the availability of food, the quality of food, and the nutritional status of the community.(Perera et al., 2006)The nutritional status of a community is very important when determining its health-disease status.(Perera et al., 2006)Patients in communities with a lower health and higher disease status will face many more health and treatment complications than a patient from a community that has a higher health and lower disease status. Having limited access to nutritious food due to location will disproportionately increase a person's risk for both food insecurity and chronic illness. Rural populations have continuously shown to have limited access to affordable and nutritious foods, but without representation or policy change, there will continue to be staggering health issues in these communities.(Odoms-Young et al., 2024; Perera et al., 2006)

## **FINANCIAL BURDEN AND CANCER OUTCOMES**

### **Impacts on Cancer Adherence**

Treatment adherence is extremely important for cancer patients to significantly improve their probability of eliminating tumors and successfully recovering. Food-insecure and low-income patients are shown to be associated with non-adherence to treatment protocols.(Gany et al., 2014; Pérez et al., 2023; Raber et al., 2022) Patients who were persistently food-insecure while facing cancer were shown to have a 13% increase in not adhering to treatment when compared to food-secure patients.(McDougall et al., 2020) Affordability, physical weakness, and anxiety towards treatment have been shown to be the biggest contributors to decreased treatment adherence in food-insecure patients. Not attending treatments or obtaining medications can severely impact the outcome of the cancer treatment. Additionally, food insecurity among cancer patients has also been shown to negatively impact adherence to colon, breast, and prostate cancer screening (Pérez et al., 2023).

In California specifically, studies have been conducted to find the correlation between low-income women who face food insecurity and breast cancer screening. This study found that 55.1% of women who are not up-to-date with screenings face food insecurity.(Abstract A090: Association between Breast Cancer Screening Adherence and Food Insecurity in Women with Low Income from California | Semantic Scholar, 2023) In comparison, 52.8% of women who are up-to-date with breast cancer screening do not face food insecurity.(Abstract A090: Association between Breast Cancer Screening Adherence and Food Insecurity in Women with Low Income from California | Semantic Scholar, 2023) Conclusively, the study found that there is a correlation between food insecurity and not

being up-to-date with breast cancer screening.(Abstract A090: Association between Breast Cancer Screening Adherence and Food Insecurity in Women with Low Income from California | Semantic Scholar, 2023) Such non-adherence to screenings can increase the risk of undetected cancer in women who do present symptoms. Screenings have been attributed to the 39% decrease in mortality rate in breast cancer among women, so the impact of not being up-to-date with screenings can be fatal.(Loud & Murphy, 2017)

### **Linkage between Food Insecurity and Cancer Prognosis**

Inadequate nutrition can significantly decrease the effectiveness of cancer treatment. Patients who have exceptionally low food security have a higher association with worse cancer outcomes, and even mortality. Researchers at Johns Hopkins found that the incidence rate of cancer is 1.03 times higher in low food-secure counties, and the rate of cancer mortality is 1.25 times higher in low food-secure counties as well.<sup>1,2</sup> Another epidemiological study conducted in Canada showed that people belonging to low socioeconomic strata are positively correlated with higher cancer mortality rates.(Perera et al., 2006) These chilling statistics show the importance of providing better nutrition access in low-income communities. Policies optimizing food assistance programs and clinical practices need to be incorporated into these communities to see decreased mortality rates (Chen et al., 2023).

## **DISPARITIES IN CANCER TREATMENT DISTRIBUTION**

Cancer rates are higher and more closely correlated to low-income and food-insecure communities.(Chen et al., 2023; Parks et al., 2022; USDA ERS - Food Insecurity, Chronic Disease, and Health Among Working-Age Adults, 2017) Studies conducted on 129,580 individuals found that 4.9% of the adults who are living under the Federal Poverty Level have cancer.(USDA ERS - Food Insecurity, Chronic Disease, and Health Among Working-Age Adults, 2017) Additionally, the same study found that 4.7% of adults with exceptionally low food security also have cancer, while only 3.9% of adults with high food security have cancer.(USDA ERS - Food Insecurity, Chronic Disease, and Health Among Working-Age Adults, 2017) Another study conducted on a population of 41,954 individuals found that those who face very low food security showed a significantly higher risk of cancer ( $p\text{-value}<0.05$ ), compared to those with marginal food security ( $p\text{-value}=0.071$ )(Significance Threshold=0.05).(USDA ERS - Food Insecurity, Chronic Disease, and Health Among Working-Age Adults, 2017) Both results highlight the significant role food insecurity can have in increasing cancer incidence in low-income communities.

### **Food Insecurity and Poverty Effects on Mental Health of Cancer Patients**

Additionally, cancer patients who face food insecurity face many mental health disorders due to this. There are links between food insecurity and mental health issues in cancer patients. Issues such as stress, anxiety, depression, and suicidal thoughts plague cancer patients who deal with inadequate diets.(Raber et al., 2022) Financial hardship, food insecurity, treatment, and less access to self-care resources all factor into the linkage of

mental health issues and cancer patients from low-income communities. The traumatic diagnosis of cancer, paired with low income and food insecurity, equates to a lower quality of life and lower satisfaction with relationships among cancer patients and survivors.(Gany et al., 2014; Parks et al., 2022)

When compared to the general population, cancer patients collectively have shown increased rates of experiencing anxiety, depression, and both anxiety and depression. Studies show that in the United States, around 13% of cancer patients have anxiety, 12% have depression, and 8.4% have both.(Alwhaibi et al., 2023) When focusing on low-income communities, there is a substantial increase in patients with both anxiety and depression. Over 19.5% of cancer patients in Poor Poverty Status have both anxiety and depression, while only 8.1% of patients in Middle Poverty Status and 4.5% of patients with high incomes have both anxiety and depression.(Alwhaibi et al., 2023) This is a considerable difference, and implies that cancer patients with low incomes and food insecurities face higher rates of mental disorders, such as anxiety and depression, than patients who have higher incomes and are food secure.

## **POLICY RECOMMENDATIONS**

Nutritional support programs are essential in decreasing food insecurity in low-income cancer patients. These programs not only provide nutritional support to patients, but they also provide mental relief as well. Interventions such as food banks and food pantries provide low-income patients with essential free food, which is important for patients who are at risk of delaying or foregoing treatment due to cost.(Pérez et al., 2023) Other clinic and hospital-based pantries provide patients with increased vegetables, increasing food consumption and nutrition quality.(Pérez et al., 2023) These programs increase treatment success, as treatment adherence, mitigation of side effects, and prognosis are all positively impacted with the implementation of nutritional support programs.(Raber et al., 2022)

To successfully mitigate the impacts of food insecurity on cancer patients from low-income communities, there is a critical need for creating targeted intervention policies. Current policies are extremely broad and are not tailored to patients with cancer. The Supplemental Nutrition Assistance Program (SNAP) provides support for individuals with disabilities, seniors, and low-income families. Though this program is providing essential assistance, over 70% of cancer patients reported that they remained food insecure even after receiving SNAP benefits.(Pérez et al., 2023) Policies need to be implemented to specifically support cancer patients facing food insecurity throughout their entire treatment.

Having policies that require clinics to have an embedded dietitian nutritionist can allow for early detection and prevention of food insecurity and its threat to negatively impact patient outcomes.(Pérez et al., 2023) Limited eligibility for federal nutritional assistance programs also should be a key focus for improving food security.(Odoms-Young et al., 2024) Increased access, or targeted access to these programs, could provide essential resources to support cancer patients in maintaining an adequate diet. Alternatively, creating policies that invest in the development of specific intervention programs would drastically improve food

security levels in cancer patients, while keeping the current eligibility policy for federal programs the same.(Chen et al., 2023; Pérez et al., 2023)

However, rigorous research is needed to provide evidence of the benefits of interventions for food insecurity among patients.(Pérez et al., 2023)Past studies provide a limited view of the prevalence and risk factors for patients with food insecurity, but not its impact on care, and how to properly solve it.(Gany et al., 2014; Pérez et al., 2023) With little research done focusing on food insecurity and its impacts among low-income cancer patients, there is a gap in understanding its true effects.(Gany et al., 2014; Pérez et al., 2023) With more focused research on this topic, the void in understanding its true effects will be filled, and policy-makers, community members, and physicians will be better equipped to combat this disparity.

## **CONCLUSION**

Food insecurity is an overlooked and critical issue for cancer patients in low-income communities and underserved communities. Keen evidence shows that a patient with inadequate nutrition will face diminished effectiveness of treatment, and increased mental health challenges. Targeted programs and proper policy change are essential for decreasing rates of malnutrition and food insecurity among cancer patients. Though nutritional assistance programs and interventions support those facing food insecurity, cancer patients have a distinct need for an adequate quantity and quality of food. To decrease the emotional, physical, and financial burden of a cancer diagnosis and a lack of food, there needs to be action. Additional research focusing on the detrimental impacts of food insecurity also needs to occur to provide evidence-based strategies and a guide to policymakers in crafting more successful policies and solutions. To conclude, the urgent need for improved access to nutrition for food-insecure patients in low-income communities represents a vital health disparity that, if addressed, will equate to more successful cancer treatments, improved quality of life, and increased survival rates.

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