Revolutionizing SUD Recovery: The Crucial Role of Nutrition in Breaking the Cycle of Poverty and Substance Abuse

Blake Sanchez
Washington and Lee University
POV 423
Professor Art Goldsmith
7 April 2023

Acknowledgements

I would like to extend my deepest gratitude to all those who have supported me throughout my capstone project, including my professors, classmates, friends, and family. In particular, I would like to express my sincerest thanks to BreAnne Rogers and the Prevention Services team at Rockbridge Area Community Services, whose unwavering support and guidance have been invaluable to me in my education and training. Their valuable insights and expertise have had a significant impact on my work, and I am truly grateful for their contributions to my research.

Dedication

This capstone project is dedicated to all those who struggle with substance use. It is my hope that this work will contribute to the ongoing conversation and research in this area, and ultimately lead to improved access to resources and support for those who need it most.

Introduction

Substance use has long been a significant problem in the United States, affecting individuals from all walks of life. It is a complex issue that can have devastating consequences, not only for the individuals who struggle with addiction but also for their families and communities. According to the most recent National Survey on Drug Use and Health (NSDUH, 2023), an estimated 46.3 million Americans aged 12 or older (or 16.5 percent of the population) met the applicable DSM-5 criteria for having a substance use disorder (SUD) in 2021, including 29.5 million people who were classified as having an alcohol use disorder (AUD) and 24 million people who were classified as having a drug use disorder. The NSDUH also reported approximately 106,699 deaths in 2021 due to drug-involved overdose – with a cumulative total rapidly approaching 1 million.

The prevalence of SUDs varies by age, gender, and race/ethnicity. Men are more likely than women to have a SUD, and the highest rates of SUDs are found among young adults aged 18 to 25 (SAMHSA, 2021). The prevalence of SUDs is also higher among certain racial and ethnic groups, including American Indian/Alaska Native and white individuals. SUDs can have significant negative impacts on individuals, families, and communities, including increased risk of physical and mental health problems, social and economic consequences, and increased risk of accidents and injuries. Effective treatment for SUDs is available and can help individuals achieve and maintain recovery, but many people with SUDs do not receive the help they need. Efforts to address the problem of SUDs in the U.S. include prevention efforts, screening and early intervention, and access to evidence-based treatment. However, ongoing research and interventions are needed to address the complex and evolving nature of SUDs and their impact on individuals and communities.

The impact of substance use on individuals living in poverty is particularly profound. The NSDUH study conducted in 2019 also approximated that 14.1% of individuals with SUDs were living below the poverty line, and an additional 20.2% were living at or above the poverty line but below 200% of the poverty line (SAMHSA, 2020). Similarly, among individuals with AUD, approximately 13.9% were living below the poverty line, and an additional 21.7% were living at or above the poverty line but below 200% of the poverty line. Poverty is often a contributing factor to substance use, and the cycle of addiction can perpetuate poverty, leading to a vicious cycle that is difficult to break.

While there are various approaches to treating SUDs, one promising avenue is through nutrition. Nutrition plays a critical role in overall health and well-being, and it has the potential to address SUD and alleviate poverty by improving physical and mental health, reducing cravings and withdrawal symptoms, and increasing resilience and self-efficacy. Despite the potential benefits of nutrition in addressing SUDs, it remains an underutilized approach, with limited research and implementation in clinical practice.

This literature review paper aims to fill this gap by exploring the role of nutrition in addressing SUD among individuals living in poverty. Specifically, the paper will examine the potential benefits of incorporating a "food first" approach into SUD treatment and identify barriers to its implementation. The "food first" model is grounded in the well-known housing first model, which prioritizes providing individuals experiencing homelessness with stable and permanent housing as a first step towards addressing their other needs, such as healthcare and employment. Similarly, the "food first" model emphasizes the importance of addressing individuals' basic nutritional needs as a first step towards addressing their SUD.

Through a thorough review of existing literature, this paper will demonstrate that nutrition plays a critical role in addressing SUD among individuals living in poverty. Specifically, the paper will highlight the ways in which poor nutrition can contribute to SUD and exacerbate its negative effects, as well as the potential benefits of proper nutrition in mitigating SUD. However, despite the potential benefits of a "food first" approach, there are significant barriers to its implementation. These barriers include a lack of funding and resources, inadequate training and education among healthcare providers, and a lack of awareness and understanding among policymakers and the general public.

Overall, this literature review paper aims to contribute to a more holistic and effective approach to addressing SUD and alleviating poverty in the United States by highlighting the critical role of nutrition in SUD treatment and advocating for a "food first" approach.

Literature Review

I. The Impact of Poverty on Substance Use: Understanding the Connection

The United States' healthcare system is a massive and costly industry that represents 17.1 percent of the GDP, with hospital care, professional services, and prescription drugs being among the largest expenditures (Nunn et al., 2020). Unfortunately, those who are medically underserved or in poor health face high and fluctuating costs due to a lack of insurance and other factors. While the U.S. healthcare system was initially designed to combat acute and infectious diseases, it now needs to shift its focus towards treating chronic long-term illnesses, such as SUDs.

With more than half of Americans living with at least one chronic disease, like SUD, specialized and frequent care is necessary to maintain healthy lives (Boersma et al., 2020). This shift towards treating chronic conditions represents a significant challenge for the healthcare system, as it involves complex factors such as economic repercussions, social stigmas, educational inadequacies, and public health crises. As such, healthcare professionals and the healthcare system as a whole need to adapt to this shift towards chronic disease management to better serve the needs of patients and the general population.

Poverty can lead to limited access to healthy foods, safe housing, and quality healthcare, which can increase the risk of chronic illnesses. Moreover, poverty can exacerbate the incidence and severity of chronic diseases, and increase the likelihood of substance abuse Additionally, people living in poverty may turn to substance abuse as a coping mechanism for the stress and hardships they face. This cycle can further perpetuate poverty and worsen health outcomes, making it crucial to address poverty as a social determinant of health in the shift towards chronic disease management. By addressing poverty and improving access to resources, healthcare systems can better manage chronic diseases and reduce the risk of substance abuse in vulnerable populations.

The relationship between poverty and substance abuse is deeply complex, and several studies have attempted to shed light on the connection between these two factors. One study (Flewelling, Rachal, & Marsden, 1992) found that unemployment was associated with a lower likelihood of substance use; however, among employed people, those with lower annual incomes were more likely than individuals with higher incomes to drink heavily, use marijuana, and use other drugs. Another study (Flewelling, Ennett, Rachal, & Theisen, 1993) found no relationship

between alcohol, marijuana, cocaine, and psychotherapeutic drug use and family income computed as a percentage above or below the Federal Poverty Line; however, the same study found that low-income families were at a higher risk of crack and hallucinogen use.

A study conducted by Smyth and Kost (1998) found that individuals who experienced more frequent changes in employment or living arrangements were more likely to engage in substance use. Similarly, individuals who experienced significant life stressors, such as divorce or the loss of a loved one, were also at an increased risk for substance use. The authors suggest that social instability – which is often fostered by poverty – creates a sense of vulnerability and insecurity, leading individuals to turn to substance use as a way to cope with stress and uncertainty.

Other research has also identified poverty as a significant risk factor for substance use (St. Joseph Institute, 2018). Poverty can create a range of stressors, including financial insecurity, limited access to resources, and exposure to violence and crime, that can increase the likelihood of engaging in substance use as a coping mechanism. Research from the St. Joseph Institute for Addiction (2018) suggests that addressing poverty as a social determinant of health is critical for reducing the risk of substance use and improving health outcomes.

While chronic financial strain does not directly predict alcohol problems, it has been found to be related to alcohol problems through depression (Smyth & Kost, 1998). This suggests that the relationship between poverty and substance abuse is not simple and direct, but rather related less to low income itself and more to the strain that results from other factors in combination with lower income, such as unemployment.

The relationship between poverty and substance abuse is not a simple and direct one. While chronic financial strain is not a direct predictor of alcohol problems, it has been found to be related to alcohol problems through depression. This connection suggests that the strain resulting from other factors in combination with lower income, such as unemployment, may contribute to substance abuse. To examine this connection, Shaw, Agahi, and Krause (2011) designed a study to investigate the association between changes in financial strain and alcohol use and smoking among older adults. The data was collected in six waves from a randomly selected national sample of older adults (N = 2,352; 60% female) between 1992 and 2006. Multilevel analyses were conducted to estimate the association between within-person changes in financial strain and the odds of heavy drinking and smoking, while also testing for the

moderating effects of gender, education, and age. The results indicated a direct association between changes in financial strain and the odds of heavy drinking, particularly among elderly men and those with low levels of education – who are likely to be poor. A direct association between changes in financial strain and the odds of smoking was also observed, particularly among middle-aged individuals. The study concluded that exposure to financial strain places some groups of older adults at increased risk for unhealthy drinking and smoking, and if the current global financial crisis leads to increases in financial strain among older adults, alcohol and smoking problems can also be expected to increase in this population.

II. Malnutrition and Food Insecurity: The Link Between Poverty and Nutrition

Another factor of strain is malnutrition, which is often interdependent with poverty, perpetuating and exacerbating it. People living in poverty face a heightened risk of lacking access to basic necessities, including nutritious food, which can lead to poor nutritional status and vulnerability to illness. This can, in turn, hinder physical and cognitive development, reduce productivity, and exacerbate poverty. Thus, the relationship between poverty and substance abuse is complex and multi-dimensional, involving a range of interconnected factors that affect an individual's overall well-being.

Malnutrition and poverty are interdependent, with malnutrition perpetuating poverty and poverty exacerbating malnutrition. This relationship can be demonstrated through various forms such as poor nutritional status, food insecurity, vulnerability to illness, reduced productivity, and hindered physical and cognitive development (World Health Organization, 2013). Individuals living in poverty face a heightened risk of lacking access to basic necessities like nutritious food, hygienic living conditions, adequate housing, and proper healthcare (World Food Programme, 2018).

Food insecurity refers to a lack of physical, social, or economic access to enough nutritious food (United States Department of Agriculture, 2020). Poverty and food insecurity are intertwined, as poverty can impact the social determinants of health and produce unfavorable conditions for a consistent food supply. For low-income households, food is a major expense, with low-income households in the US spending between 28.8-42.6% of their income on food compared to 6.5-9.2% of income in high-income households (Nord et al., 2009). This high cost

of food can lead to financial limitations and the consumption of cheap, energy-dense staple foods, like carbohydrates and fats, instead of nutritionally dense foods.

While people living in poverty may have a high caloric intake, the quality of food consumed, and the appropriate intake of nutrients must also be considered. Poverty can contribute to worsening malnutrition by lowering the quality of food intake and increasing "hidden hunger," the deficiency of essential vitamins and minerals (World Health Organization, 2013). Common deficiencies seen in individuals living in poverty include iron, folate, Vitamin A, iodine, and zinc, leading to subpar mental and physical development, recurrent infections, and adverse birth outcomes, among others (World Health Organization, 2013).

Improved nutritional status is essential for breaking the cycle of poverty, as good health increases productivity, contributes to economic growth, and improves a country's overall well-being (World Health Organization, 2013). Addressing malnutrition and poverty requires a comprehensive approach that addresses the root causes of poverty and malnutrition, including access to nutritious food, adequate healthcare, and improved living conditions (World Food Programme, 2018). The eradication of poverty and malnutrition is necessary for achieving global health and prosperity.

Malnutrition and poverty are deeply interconnected, with malnutrition exacerbating poverty and poverty perpetuating malnutrition. This relationship can manifest in various ways, including poor nutritional status, food insecurity, and vulnerability to illness, which can lead to hindered physical and cognitive development, reduced productivity, and increased healthcare costs. The adverse effects of poverty on nutrition and health have been well documented, and research has shown that individuals living in poverty are at higher risk for a range of health problems, including SUDs. In this context, food insecurity can serve as a potential risk factor for substance use, as individuals may turn to drugs or alcohol to cope with the stress and uncertainty of not having enough food. Thus, the link between poverty, malnutrition, and substance use is complex and multidimensional, requiring a holistic approach to address the underlying issues.

III. The Impact of Substance Use on Nutritional Health

Individuals with SUDs are often at a heightened risk of food insecurity due to accompanying social and economic factors. In a study by Anema et al. (2010), 65% of people who inject drugs in urban areas reported difficulties in affording enough food and hunger.

Similarly, 58% of individuals who inject drugs in Los Angeles and San Francisco reported food insecurity in a 2016 study by Schmitz et al. (2016).

Drug use can have both physiological and behavioral impacts on the nutritional and health status of individuals with SUDs. Substance use can lead to drug-induced anorexia, which can result in deficiencies in micronutrients, malnutrition, and underweight (Himmelgreen et al., 1998).

Food insecurity has been found to be associated with depressive symptoms among individuals with SUDs (Anema et al., 2010). The lack of resources to purchase food, the consumption of nutritionally inadequate food, irregular eating habits, and engagement in behaviors such as stealing food or trading sex for food, or engaging in unprotected sex can all contribute to food insecurity among individuals who use drugs (Anema et al., 2016; Neale, Nettleton, Pickering, & Fischer, 2012). Food insecurity can destabilize individuals' lives, increasing their vulnerability to violence, incarceration, and exposure to pathogens.

Furthermore, there is a growing body of research suggesting that food insecurity and malnutrition are associated with an increased risk for behavioral health disorders, such as depression and anxiety, which in turn can put individuals at greater risk for developing other disorders such as SUD. Kris-Etherton et al. (2020) conducted a study which aimed to provide an overview of the role of nutrition in the prevention and management of depression and anxiety, which are two behavioral health disorders with a significant global burden. Their research suggested that suboptimal nutrition can contribute to the underlying pathology of these disorders, making optimizing nutritional status an important component of their prevention and treatment. Healthy eating patterns that meet dietary recommendations and nutrient requirements are likely to have a beneficial impact on both prevention and treatment of these disorders.

Kris-Etherton et al. (2020) reviewed recent evidence on the potential contribution of nutrition to depression and anxiety. They assert that randomized controlled trials are necessary to better understand the biological mechanisms through which nutrition affects these disorders, since these disorders can impact nutritional status. Such trials will also help develop effective evidence-based nutrition interventions to reduce the impact of these disorders and promote well-being among individuals affected by them. For example, Kris-Etherton et al. (2020) emphasized the importance of addressing nutritional deficiencies in the prevention and treatment of depression and anxiety. Certain nutrient deficiencies, such as those in vitamin D, B vitamins, and

omega-3 fatty acids, have been linked to these disorders, and addressing these deficiencies through diet or supplementation may be an effective approach to improving mental health. Addressing mental health disorders can be an effective way to prevent and address SUDs. By improving overall mental well-being, individuals may be less likely to turn to substance use as a coping mechanism. Furthermore, addressing the underlying mental health conditions that often co-occur with SUDs can improve the chances of successful recovery from substance abuse.

Individuals with SUDs often face food insecurity, even in areas with ample food resources such as homeless shelters, food pantries, and soup kitchens. This is due to financial limitations, decreased appetite from drug use, limited time and resources to focus on food, lack of storage and cooking facilities, and safety concerns when accessing public food options. For those struggling with substance use and poverty, priority is often given to purchasing drugs to avoid withdrawal, leaving food as a secondary concern.

For this reason, many individuals with SUDs turn to charitable food providers, whether that be through soup and community kitchens or meals provided through supportive housing and rehabilitative centers. In a study by Clatts, Welle, Goldsamt, & Lankenau (2002), every respondent reported using these services for at least one of their daily meals. Moreover, 60% of respondents reported using free or low-cost food meal programs for the majority of their meals. At the same time, simply accessing food can put individuals at risk from fights and inter-personal conflicts with others accessing the site, stress form dealing with staff who may enforce rules and regulations that bar certain individuals, or encounters with law enforcement. These risks can result in physical or psychological harm or incarceration.

Many respondents in the Clatts and colleagues' study (2002) acknowledged the negative consequences of drug use on food intake, and reported they were aware of the problems of weight loss and dehydration and reported developing strategies to avoid these effects. These included taking multivitamins, drinking sports drinks to avoid dehydration, smoking marijuana to stimulate appetite, or buying food in advance of using drugs to guarantee that they had something to eat if they were unable to access food providers.

SUDs pose a complex challenge to the medical community, as they involve both physical and psychological dependence on substances. Treating SUDs requires a multi-faceted approach that addresses both the underlying causes of the disorder and the physical effects of substance abuse. However, the nature of SUDs makes them particularly difficult to treat, as individuals

with these disorders often have co-occurring mental health conditions, such as depression or anxiety, that complicate the treatment process. Additionally, relapse rates are high among those with SUDs, which underscores the chronic and often persistent nature of these disorders. Thus, effective treatment of SUDs requires a comprehensive, individualized approach that takes into account the complexity and unique needs of each patient.

IV. Nutrition as Treatment for Substance Use

Recent literature suggests that nutrition may play a key role in the treatment of SUDs. Proper nutrition can improve overall health and well-being, which can in turn reduce the risk of relapse and improve treatment outcomes. For example, research has shown that individuals with SUDs often have poor nutrition and dietary habits, which can exacerbate the physical and psychological effects of substance abuse (Ross et al., 2012). Providing nutritional support, such as vitamin and mineral supplements, may help to reduce cravings and improve overall health, making it easier for individuals to recover from SUDs. Moreover, addressing nutritional deficiencies and promoting a healthy diet can be an indirect way of alleviating poverty, which is often associated with higher rates of substance abuse. Thus, incorporating nutritional support into SUD treatment plans can have both direct and indirect benefits for patients, making it an important consideration for healthcare providers working with this population.

Ross et al. (2012) aimed to evaluate the provision of nutrition education in substance abuse treatment programs and determine if there was a correlation between the provision of nutrition services and treatment outcomes. The study found that there was a positive association between the provision of nutrition education services and improved Addiction Severity Index (ASI) composite scores, particularly in the psychological, medical, and family/social domains. Group nutrition/substance abuse education was found to be particularly effective in improving ASI scores. Specifically, when group nutrition/substance abuse education was offered, ASI psychological and medical domain scores improved by 68% and 56%, respectively ($P<0.05$).

Additionally, individual nutrition/substance abuse education was a predictor of ASI family/social domain change scores improving by 99%. The study also found that programs offering group nutrition/substance abuse education offered significantly more nutrition services overall. Moderate to strong correlations with various nutrition education services were observed,

specifically in individual nutrition/substance abuse education, group normal/nutrition education and individual normal/nutrition education.

Ross et al. (2012) concluded that nutrition education is an essential component of substance abuse treatment programs and should be encouraged by dietitians. They also highlighted the effectiveness of group nutrition/substance abuse education in improving treatment outcomes and the importance of providing a comprehensive range of nutrition services in substance abuse treatment programs.

Similarly, researchers Kendall Jeynes and E Leigh Gibson (2017) conducted a study to examine the relationship between SUDs and nutrition, and to explore the implications of this relationship for understanding addiction and promoting recovery. Their research highlights the fact that despite the importance of nutrition for overall health, there is no specific nutritional assessment or guidance for individuals with SUDs. The authors argue that malnutrition may promote drug seeking and impede recovery from SUDs.

Jeynes and Gibson's (2017) review examined the evidence for nutrient deficiencies in individuals with AUD and DUD, as well as their impact on metabolism and appetite regulation. The authors argue that nutrient deficiencies may be implicated in various physical and psychological health problems observed in individuals with SUDs, including alcoholic myopathy, osteopenia, osteoporosis, anxiety, and depression. The article also explored the biopsychology of addiction and appetite, highlighting the ways in which brain processes involved in survival are stimulated both by food and by substances of abuse. The authors suggest that this may contribute to confusion between cravings for substances and cravings for food during recovery from SUDs. Overall, the article emphasized the importance of addressing the nutritional needs of individuals with SUDs in order to support their physical and psychological health and promote recovery.

In conclusion, this literature review highlights the complex and multifaceted relationship between poverty, malnutrition, and SUDs. It underscores the negative impact of poverty and food insecurity on individuals' nutritional status, physical and mental health, and overall well-being, particularly among those with SUDs. The review also emphasizes the importance of a comprehensive approach that addresses the root causes of poverty and malnutrition, including access to nutritious food, adequate healthcare, and improved living conditions. Moreover, the review highlights the importance of addressing the underlying mental health conditions that often

co-occur with SUDs, as well as nutritional deficiencies, in the prevention and treatment of these disorders. Addressing the complex interplay between nutrition, poverty, and health requires a multi-faceted approach that recognizes the structural and systemic barriers faced by disadvantaged groups. While existing policies have made some strides in improving access to healthy food options, there is still a need to reshape food policy and governance to incentivize and empower these groups. By prioritizing the voices and needs of those most affected by poor nutrition and poverty, we can work towards creating a food system that is more equitable, just, and sustainable for all. Through targeted interventions such as community-led nutrition education programs and expanding access to healthy food options in underserved areas, we can begin to lay the groundwork for a more just and equitable food system that empowers disadvantaged groups to lead healthy and fulfilling lives. By adopting a holistic approach that addresses these issues, we can break the cycle of poverty and malnutrition, improve health outcomes, and reduce the impact of SUDs on individuals and society.

Methodology

In order to investigate the complex and interconnected relationship among poverty, nutrition, and substance abuse, I conducted a comprehensive literature review on the subject matter. The review examined various direct connections between poverty and substance abuse, poverty and nutrition, and poverty and mental health. Additionally, I explored recent literature that assessed the indirect impact of nutrition on substance abuse and mental health via poverty.

To search for relevant articles, I primarily used PubMed database. When PubMed yielded insufficient literature, I turned to Google search engine to supplement my search. I also used Google to locate non-scientific articles such as news articles and press releases. PubMed was identified as the primary database for this comprehensive review due to its vast repository of over 30 million citations and abstracts of biomedical literature (National Center for Biotechnology Information, n.d.). In instances where the complete article was not readily available on PubMed, access was sought through the university library at library.wlu.edu. This freely available resource is widely utilized in all domains of biomedical research and reviews, rendering it a comprehensive and accessible source of literature on various complex topics and scientific disciplines. For the purpose of this review, literature spanning the last 15 years was primarily considered for its contemporary relevance. Nonetheless, seminal works that are

deemed pertinent to the topic under investigation, irrespective of their age, were also included. Furthermore, emphasis was placed on articles related to United States policy and healthcare system. Nevertheless, pertinent research from other global regions was also considered where relevant to the scope of this review.

The initial selection of articles was compiled using carefully chosen phrases and search terms. Key search terms and phrases such as “substance use disorders”, “substance abuse”, “nutrition”, “malnutrition”, “food insecurity”, “mental health”, and “poverty” were used. The search terms were separated using "AND" and "OR" operators, with parentheses used for phrases to ensure that only relevant results were displayed. Literature was excluded if it did not relate to the key themes of substance use, poverty, or nutrition. Furthermore, articles were excluded if they were inaccessible, did not relate to the research question, or presented data from other countries.

The data extracted from each article was distilled into a concise summary of the main results or conclusions, while highlighting the complexities of the study. Population studied and other relevant measurements were noted next to the conclusions and title of the article. The relevance of each study to the research question of this paper was also recorded. Surveys and statistics related to the diagnosis, treatment, and effect of SUDs, especially in conjunction with nutrition and poverty, were given particular emphasis, as they were integral to the background research of this study and aided in drawing conclusions.

Despite the numerous benefits of a systematic review, it is important to recognize the limitations and biases that persist. The static nature of search terms and associated phrases may result in the exclusion of a significant amount of relevant research. The reliance on surveys and statistics to analyze diagnoses and treatments may neglect the emotional and judgmental aspects of the patient-provider interaction, which form the foundation of diagnoses, treatment, and their outcomes. Succinctly summarizing each conclusion from sources may oversimplify complex findings and result in a potentially erroneous determination. Furthermore, biases may be present in reporting substance use, mental health, and poverty, as well as oversimplification of trends. It is imperative to acknowledge these limitations and biases, especially in marginalized communities, to create an accurate depiction of the multifaceted relationship between substance use, nutrition, and poverty.

Ethical Considerations

1. Substance Abuse and Treatment

SUD is a complex medical condition that requires medical attention and psychological support. However, ethical considerations surrounding the treatment of SUD can be complex, as some individuals may not seek treatment due to fear of discrimination, stigma, and legal consequences. Healthcare professionals must balance the patient's autonomy and their obligation to provide treatment. It is also essential to acknowledge the role of social and cultural factors that can lead to SUD, such as poverty and social exclusion. Ethical considerations when addressing SUD include informed consent, confidentiality, and harm reduction. Informed consent is the process of obtaining consent from the patient before providing treatment. This is especially important when treating individuals with SUD, as they may not be able to make informed decisions due to the effects of drugs or alcohol.

Confidentiality is also essential when treating individuals with SUD, as they may fear legal or social consequences if their condition is made public. However, confidentiality must be balanced against the need to protect the patient's safety and the safety of others.

Harm reduction is an ethical approach to SUD that focuses on reducing the negative consequences of drug use, such as overdose or the transmission of infectious diseases. This approach can involve providing clean needles, overdose prevention medication, and access to addiction treatment.

2. Malnutrition

Malnutrition is a complex issue that can result from inadequate intake of nutrients, underlying medical conditions, or poverty. The ethical considerations surrounding malnutrition include the right to adequate nutrition, the right to healthcare, and the responsibility of healthcare providers to address malnutrition. The right to adequate nutrition is a fundamental human right recognized by the United Nations. This right includes access to safe, nutritious, and culturally appropriate food. Healthcare providers have a responsibility to ensure that their patients have access to adequate nutrition and to address any underlying medical conditions that may be contributing to malnutrition. However, addressing malnutrition can be complicated, as some individuals may not have access to nutritious food due to poverty or social exclusion.

Another ethical consideration when addressing malnutrition is the right to healthcare. All individuals have the right to access healthcare, including medical treatment for malnutrition. Healthcare providers must ensure that their patients have access to the necessary medical care and nutritional support. However, healthcare providers must also address any underlying medical conditions that may be contributing to malnutrition, such as eating disorders or gastrointestinal disorders.

3. Poverty

Poverty is a complex issue that can lead to SUD, malnutrition, and a range of other health problems. Addressing poverty requires a multifaceted approach that takes into account social, economic, and political factors. The ethical considerations surrounding poverty include the right to a standard of living adequate for health and well-being, the right to work and education, and the responsibility of governments to address poverty. The right to a standard of living adequate for health and well-being is a fundamental human right recognized by the United Nations. This right includes access to food, clothing, housing, and medical care.

Governments have a responsibility to address poverty and ensure that all individuals have access to the basic necessities of life. Healthcare providers also have a responsibility to address poverty and its effects on health, such as malnutrition and SUD. The right to work and education is another ethical consideration when addressing poverty. All individuals have the right to access education and to work in safe and healthy conditions. Education and employment can provide individuals with the resources they need to access adequate nutrition and healthcare. Governments and healthcare providers must work together to address the social and economic factors that contribute to poverty, such as discrimination, unequal access to education and employment opportunities, and the lack of social safety nets. This requires a collaborative approach that involves policymakers, healthcare providers, and community organizations working together to address the root causes of poverty and promote social and economic equality. By working together, we can create a society that is more equitable, just, and compassionate, and that provides all individuals with the opportunity to lead healthy and fulfilling lives.

4. *Housing First Model*

The Housing First model is based on the principle that individuals experiencing homelessness have a right to housing, regardless of their personal circumstances, including addiction or mental illness. This principle is grounded in the ethical principle of individual autonomy, which recognizes the right of individuals to make their own decisions about their lives, including where they live and how they receive support services. By providing individuals with housing first, without preconditions such as sobriety or participation in treatment programs, the Housing First model upholds this principle of autonomy and recognizes the dignity and worth of all individuals.

However, the Housing First model also raises ethical considerations related to social justice. The model prioritizes individuals experiencing chronic homelessness, who are often the most vulnerable and marginalized members of society. While this is a laudable goal, it raises questions about the allocation of resources and the fairness of providing housing to some individuals while others remain homeless. Additionally, the Housing First model may exacerbate existing inequities in access to affordable housing and support services, as resources are focused on a select group of individuals – the winners or those given this option when others with housing needs are less fortunate.

Another ethical consideration of the Housing First model is the tension between individual autonomy and community safety. Providing individuals with housing first, without preconditions such as sobriety or participation in treatment programs, may increase the risk of harm to themselves or others. For example, individuals with severe addiction or mental illness may engage in risky or dangerous behaviors that could endanger themselves or others in their community. This tension between individual autonomy and community safety highlights the need for a balanced approach that prioritizes both individual rights and the safety of the wider community.

Additionally, addressing the problem of addiction among individuals experiencing homelessness also requires a focus on food and nutrition, as addiction and food insecurity are closely linked.

5. *Food First* as Harm Reduction

The Food First approach is a harm reduction strategy because it addresses the root causes of food insecurity, malnutrition, and hunger. It recognizes that the lack of access to nutritious food is a structural problem that requires systemic changes. The Food Sovereignty movement advocates for the rights of local communities to control their food systems, including the production, distribution, and consumption of food. This approach prioritizes food as a basic human right, rather than a commodity to be bought and sold in the global market.

Food First also promotes the use of sustainable farming practices and local food systems. It emphasizes the importance of preserving biodiversity, soil health, and water resources. This approach promotes the use of agroecological farming practices, such as crop rotation, intercropping, and the use of natural fertilizers. These practices can increase the productivity of small-scale farms, reduce the use of harmful chemicals, and improve the health of the soil.

Another aspect of Food First as harm reduction is its focus on social justice and equity. The Food Sovereignty movement recognizes that food insecurity, malnutrition, and hunger are linked to systemic inequalities, such as poverty, racism, and gender discrimination. This approach aims to empower marginalized communities to participate in decision-making processes that affect their food systems. It advocates for policies that support small-scale farmers, women, and indigenous peoples in accessing land, water, and other resources necessary for food production.

6. Respect for Autonomy and the Benefit of Treatment

The Food First approach, akin to other harm reduction models, espouses the principle of respecting the autonomy of individuals in their capacity to make decisions concerning their substance use or other potentially detrimental activities. Respect for autonomy is recognized as one of four fundamental principles of Biomedical Ethics by Beauchamp and Childress (2001) and highlights the right of individuals to exercise self-determination in decision-making and in the type and degree of care they receive. In the context of food assistance programs, respect for autonomy is demonstrated through policies that do not require individuals to be sober, abstinent, or adhere to treatment as a condition for

participating. Adhering to this principle means that even if individuals choose not to attend treatment or to continue consuming alcohol or drugs, food is not used as an incentive to encourage them to change their behavior. While the possibility of food assistance participants seeking treatment is always available, the decision to do so is theoretically solely in the hands of the individual, and not a result of coercion from the institution.

7. Addiction, Mental Illness, and Self-Determination

The issue of autonomy in interventions for substance abuse and psychiatric illnesses has been a longstanding dilemma. However, the context of food first interventions presents a contrasting situation. In instances where an individual with a mental illness or substance abuse disorder is surrounded by family members or colleagues, an intervention may be staged to challenge the individual's autonomy and decision-making. In such cases, the individual may be persuaded to seek treatment, but the ethics of such interventions are not the focus of this paper.

In contrast, there are no staged group interventions in the food first context. Many individuals with substance abuse disorders lack a support network of family, friends, and colleagues, which makes it difficult to compel them to attend treatment. Additionally, seeking public funding for treatment requires a significant exercise of autonomy. Therefore, individuals who seek treatment despite the lack of demands from food first programs likely do so without coercion.

The absence of staged interventions in the food first context raises important ethical questions. In particular, it begs the question of how best to balance an individual's autonomy with the need to ensure they receive necessary treatment. Nonetheless, it is evident that the lack of coercion in the food first context has both advantages and disadvantages, and further research is needed to understand the implications of this approach on recovery outcomes.

8. Exceptions to the Principle of Autonomy

In the context of the "food first" approach to SUD, a crucial aspect of the debate pertains to whether healthcare professionals, food service providers, etc. should intervene in participants' substance use or psychiatric illness. Beauchamp and Childress (2001) highlight the existence of a tension between respect for autonomy and protection, which necessitates

prioritizing respect for autonomy, except in cases where there is significant risk for harm or questions of decisional capacity, in which case protection may trump respect for autonomy.

Another ethical consideration is the need for nutritional guidelines that prioritize meeting all nutritional expectations, rather than just daily minimum caloric intake. While the current model emphasizes meeting daily minimum caloric intake, there may be other nutritional requirements that are necessary for participants' overall health and well-being. Therefore, service providers should consider incorporating more comprehensive nutritional guidelines to support participants in achieving positive outcomes.

In addition, there is a need for more nutrition education to empower participants to make informed decisions about their health and well-being. Service providers can provide information and education about the potential risks and benefits of different treatment options and support participants in making informed decisions that align with their values and goals. However, it is crucial to ensure that any interventions or guidance provided by service providers are respectful of participants' autonomy and avoid coercion or undue influence.

Ultimately, the goal of the "food first" approach should be to empower participants to make choices that align with their values and goals and support them in achieving positive outcomes. By incorporating ethical considerations and nutritional guidelines in the "food first" approach, we can ensure that it is not only effective in addressing SUD and poverty but also respects participants' autonomy and promotes their overall health and well-being.

9. Beneficence and Nonmaleficence

Among the principles of bioethics set forth by Beauchamp and Childress (2001) are beneficence and nonmaleficence. There are two components to beneficence: positive beneficence and utility. Positive beneficence requires the acting individual to provide benefits, while utility requires that individuals balance benefits and drawbacks to produce the best overall results.

In the context of using the food first approach in individuals with SUD, the principles of beneficence and non-maleficence are particularly relevant. Healthcare professionals must balance the potential benefits of using the food first approach in improving the nutritional status and health outcomes of individuals with SUD against the potential risks of triggering relapse. By carefully selecting the type of food and timing of meals, and closely monitoring

individuals with SUD, healthcare professionals can minimize the risk of harm associated with the food first approach.

The principles of beneficence and non-maleficence in using the food first approach in individuals with SUD can be implemented into policy in several ways. One possible approach is to incorporate the food first approach into the standard of care for individuals with SUD in healthcare settings. This would involve developing guidelines for healthcare professionals on the selection of appropriate foods and timing of meals to minimize the risk of triggering relapse and improve nutritional status.

Another possible approach is to provide funding for nutrition education and counseling for individuals with SUD. This could include training healthcare professionals in nutrition and providing resources for individuals with SUD to learn about healthy eating habits and food choices. Additionally, funding could be provided to community-based organizations that work with individuals with SUD to provide nutrition education and access to healthy foods.

To ensure that the principles of beneficence and non-maleficence are being upheld, policies could also require regular monitoring and evaluation of the food first approach in individuals with SUD. This could involve tracking changes in nutritional status and health outcomes of individuals with SUD over time, as well as monitoring for potential relapse triggers and adverse effects of the food first approach.

Furthermore, policies could address food insecurity in individuals with SUD, as this is often a significant barrier to accessing healthy foods. This could involve funding for food banks and other programs that provide access to healthy foods for individuals with SUD, as well as policies to address structural factors that contribute to food insecurity, such as poverty and lack of access to affordable housing.

10. Justice

The principle of justice is a cornerstone of biomedical ethics, encompassing the equitable, fair, and appropriate treatment of individuals. In the context of SUD and food first, justice plays a critical role in guiding treatment decisions and ensuring that individuals receive the care and resources that they deserve.

When treating individuals with SUD, the principle of justice requires that healthcare providers strive to eliminate health disparities and ensure equal access to treatment for all patients. Unfortunately, this is often not the case, as marginalized populations, such as low-income individuals and racial and ethnic minorities, are frequently underserved in the healthcare system. Moreover, individuals with SUD often face stigma and discrimination, further exacerbating these disparities.

In the food first model, justice plays a critical role in ensuring that individuals have access to adequate nutrition. This model advocates for the use of food as the first-line treatment for malnutrition, rather than relying on expensive supplements or medical interventions. However, access to healthy and affordable food is not evenly distributed, with low-income communities and communities of color frequently lacking access to nutritious food options. This lack of access perpetuates health disparities and undermines the principles of justice.

Despite efforts to promote justice in healthcare and nutrition, there are instances where justice falls short. For example, individuals with SUD who have a history of criminal activity may face discrimination and stigma, resulting in reduced access to healthcare services. Similarly, individuals living in food deserts may lack access to healthy food options, despite efforts to promote equitable distribution of resources. To address these shortcomings, it is critical to promote policies and interventions that address the root causes of health disparities and ensure that all individuals have access to the resources and care that they need. This may include policies to increase access to healthcare and nutrition resources for underserved communities, as well as efforts to reduce stigma and discrimination. Moreover, it is important to recognize the interconnectedness of health and social justice, and to work towards creating a more just and equitable society for all.

Recommendations

There is a growing body of evidence linking SUD and poverty to poor nutrition and inadequate food access. Individuals living in poverty are more likely to experience food insecurity, which can lead to malnutrition, chronic diseases, and mental health problems. Moreover, people with SUDs are at a higher risk of poor nutrition due to the physical and psychological effects of drug use, as well as the social and economic consequences of addiction.

For example, individuals with opioid addiction may prioritize buying drugs over buying food, leading to a cycle of malnutrition and addiction.

Conversely, providing access to healthy, nutritious food can have a significant positive impact on both SUD and poverty. Research has shown that good nutrition can improve mental health outcomes, reduce drug cravings and relapse rates, and improve overall physical health. Additionally, providing access to healthy food can help reduce food insecurity and poverty by improving economic outcomes, as well as reducing healthcare costs associated with chronic diseases.

In order to implement a "food first" approach to addressing SUD and poverty, a number of crucial steps must be taken. These steps include the following:

Firstly, there is a need to increase access to healthy, nutritious food for individuals and communities affected by SUD and poverty. This could involve a range of interventions, such as expanding food assistance programs, increasing funding for community gardens and urban agriculture, and developing partnerships with local farmers and food distributors. One potential way to address the intersection SUD and poverty with nutrition is through the expansion of federal and/or state nutrition programs, such as the Supplemental Nutrition Assistance Program (SNAP).

SNAP provides food assistance to low-income individuals and families and can help reduce food insecurity and improve nutrition. However, there are limitations to the program, including strict eligibility requirements, limited benefits, and stigma associated with receiving assistance. Expanding SNAP and other nutrition programs could have a significant impact on individuals and communities affected by SUD and poverty. By providing access to healthy, nutritious food, these programs could help address the negative health consequences of food insecurity and poor nutrition, as well as reduce the economic burden associated with chronic diseases.

It is also important to recognize the negative externalities of SUD in communities. These can include increased crime rates, healthcare costs, and lost productivity. Addressing the root causes of SUD, such as poverty and inadequate access to nutritious food, can help reduce these negative externalities and improve overall community well-being.

Secondly, nutrition should be integrated into SUD treatment in order to improve outcomes and reduce relapse rates. Relapse rates are notoriously high, with many individuals

experiencing multiple relapses throughout their recovery journey. An emerging body of research has identified a potential solution to this problem: the integration of nutrition into SUD treatment.

There is strong evidence to suggest that SUD can have a significant impact on an individual's nutritional status. Substance use can lead to poor dietary choices, inadequate nutrient intake, and metabolic disturbances. Conversely, poor nutrition can also exacerbate the effects of substance use, leading to increased cravings, impaired cognition, and a heightened risk of relapse. Therefore, addressing nutritional deficiencies in individuals with SUDs is essential for improving treatment outcomes.

One effective strategy for integrating nutrition into SUD treatment is through collaboration with nutritionists and dietitians. These healthcare professionals are experts in nutrition and can develop personalized nutrition plans for individuals in treatment. By working closely with individuals in recovery, nutritionists and dietitians can help identify and address any nutritional deficiencies, provide guidance on healthy eating habits, and offer ongoing support and counseling.

Another critical component of integrating nutrition into SUD treatment is nutrition education. By providing individuals with information about healthy food choices, the relationship between nutrition and addiction, and the benefits of proper nutrition for recovery, treatment programs can empower individuals to take charge of their health and well-being. Nutrition education can be delivered through individual counseling sessions, group classes, or through written materials.

Thirdly, the promotion of food sovereignty and community empowerment is a critical component of any comprehensive food policy. Food sovereignty refers to the right of communities to control their own food production and distribution systems, free from external pressures and influences. This approach prioritizes the needs and values of communities, emphasizing local knowledge, traditions, and resources. Empowering communities to take control of their own food systems can lead to numerous benefits, including reduced food insecurity, improved economic outcomes, and enhanced community well-being.

One effective strategy for promoting food sovereignty and community empowerment is through the development of community-led food cooperatives and farmers' markets. These initiatives can help to provide fresh, healthy food options to individuals and families who may

not have access to these resources. By sourcing food from local farmers and producers, these initiatives also support the local economy and help to build community connections. To ensure the sustainability and success of these initiatives, policymakers should consider providing funding and technical support for their development, as well as addressing any legal or regulatory barriers that may exist.

In addition to food cooperatives and farmers' markets, policymakers should also consider providing training and resources for individuals and communities to develop their own food systems. This could include training in sustainable agriculture practices, food preservation techniques, and marketing and distribution strategies. By providing individuals with the knowledge and skills to grow and distribute their own food, policymakers can promote self-sufficiency and resilience, while also reducing dependence on external food systems. Such training and resources can be delivered through community-based organizations, educational institutions, or government agencies.

To support the promotion of food sovereignty and community empowerment, policymakers should consider implementing policies that prioritize community engagement and participation. This could include developing advisory committees or task forces that include representatives from local communities, as well as conducting community needs assessments and impact assessments to ensure that policies and programs are responsive to local needs and values. Policymakers should also consider providing incentives and support for community-led initiatives, such as tax breaks or grants, as well as creating regulatory frameworks that enable and facilitate local food production and distribution.

Lastly, it is crucial to address systemic inequalities in the food system in order to achieve a "food first" approach that truly benefits all individuals and communities affected by SUD and poverty. Historically, the food system has been shaped by structural inequalities such as racism, classism, and sexism, which have resulted in unequal access to nutritious food, stable employment, and safe working conditions. To achieve a "food first" approach that truly benefits all individuals and communities affected by SUD and poverty, it is crucial to address these systemic inequalities.

One effective strategy for promoting food justice is through the advocacy for policies that promote fair labor practices. The food system relies heavily on low-wage labor, often employing workers who are immigrants, people of color, and women. These workers frequently experience

exploitative working conditions, including low wages, long hours, and lack of access to benefits such as health care and retirement. Advocating for policies that protect the rights and dignity of food workers, such as minimum wage laws, health and safety regulations, and collective bargaining rights, can help to promote fair labor practices and reduce exploitation in the food system.

Another key strategy for promoting food justice is through land reform. Access to land is a critical determinant of food security, yet many low-income communities and communities of color lack access to land for food production. Policies that promote land reform, such as community land trusts and urban agriculture programs, can help to address this inequality by providing individuals and communities with the means to grow their own food and generate income. In addition to providing access to land, policymakers should also consider providing technical assistance and training to support sustainable and regenerative agricultural practices.

Finally, policymakers should also advocate for anti-hunger initiatives that ensure all individuals and families have access to nutritious food. This could include policies such as expanding eligibility for federal nutrition assistance programs, increasing funding for school meal programs, and supporting community-based food banks and meal programs. By addressing food insecurity, policymakers can help to mitigate the negative impacts of SUD and poverty, including poor health outcomes and increased risk of relapse.

Conclusion

Substance use remains a significant problem in the United States, affecting individuals from all walks of life. The most recent National Survey on Drug Use and Health reported that millions of Americans meet the applicable DSM-5 criteria for having a SUD, and drug-involved overdose deaths continue to rise. SUDs can have significant negative impacts on individuals, families, and communities, and effective treatment is essential to achieving and maintaining recovery. However, many people with SUDs do not receive the help they need, and ongoing research and interventions are needed to address the complex and evolving nature of SUDs and their impact on individuals and communities. The impact of substance use on individuals living in poverty is particularly profound, perpetuating a vicious cycle that is difficult to break. Nutrition is a promising avenue for addressing SUD and alleviating poverty by improving physical and mental health, reducing cravings and withdrawal symptoms, and increasing

resilience and self-efficacy. Despite its potential benefits, nutrition remains an underutilized approach, with limited research and implementation in clinical practice. This literature review aimed to contribute to a more holistic and effective approach to addressing SUD and alleviating poverty in the United States by shedding light on the potential benefits of nutrition and identifying barriers to implementation.

In conclusion, a comprehensive approach to addressing SUD and poverty must include policies that address food insecurity and promote food justice. This can entail a "food first" approach that recognizes the critical role that access to healthy, nutritious food plays in achieving overall health and well-being. Such a policy approach should involve promoting community-based food systems, integrating nutrition into SUD treatment, empowering communities to take control of their own food production and distribution, and addressing systemic inequalities in the food system.

Community-based food systems can be developed through the creation of food cooperatives, farmers' markets, and urban agriculture programs that provide local, sustainable, and affordable food options. Integrating nutrition into SUD treatment can help improve outcomes and reduce relapse rates by creating personalized nutrition plans and providing education and counseling. Empowering communities to take control of their own food production and distribution can help promote food sovereignty, reduce food insecurity, and improve economic outcomes. Finally, addressing systemic inequalities in the food system can promote food justice, including fair labor practices, land reform, and anti-hunger initiatives.

In summary, a comprehensive approach to addressing SUD and poverty must recognize the critical importance of access to healthy, nutritious food. Policymakers should consider implementing policies that promote food justice and create sustainable and equitable food systems that support the health and well-being of all individuals and communities. By working to address food insecurity and systemic inequalities in the food system, policymakers can help to reduce the negative impacts of SUD and poverty and improve the overall health and well-being of individuals and communities.

Works Cited

Anema, A., Wood, E., Weiser, S. D., Qi, J., Montaner, J. S., & Kerr, T. (2010). Hunger and associated harms among injection drug users in an urban Canadian setting. *Substance abuse treatment, prevention, and policy*, *5*, 20. https://doi.org/10.1186/1747-597X-5-20

Beauchamp, T. L., & Childress, J. F. (2001). Principles of biomedical ethics. (5th ed.). New York, NY: Oxford University Press, Inc.

Boersma, P., Black, L. I., & Ward, B. W. (2020). Prevalence of multiple chronic conditions among US adults, 2018. Preventing Chronic Disease, 17, 200130. https://doi.org/10.5888/pcd17.200130

Christiana Miewald, Eugene McCann, Alison McIntosh & Cristina Temenos (2018) Food as harm reduction: barriers, strategies, and opportunities at the intersection of nutrition and drug-related harm, Critical Public Health, 28:5, 586-595, doi: 10.1080/09581596.2017.1359406

Clatts, M. C., Welle, D. L., Goldsamt, L. A., & Lankenau, S. E. (2002). An ethno-epidemiological model for the study of trends in illicit drug use: Reflections on the 'emergence' of crack injection. Journal of Drug Issues, 32(4), 1089-1108.

Flewelling, R.L., Ennett, S.T., Rachal, J.V., & Theisen, A.C. (1993). National household survey on drug abuse: Race/ethnicity, socioeconomic status, and drug abuse 1991. (DHHS Publication No. (SMA) 93-2062). Washington, DC: Susbstance Abuse and Mental Health Services Administration.

Flewelling, R.L., Rachal, J.V., & Marsden, M.E. (1992). Socioeconomic and demographic correlates of drug and alcohol use: Findings from the 1988 and 1990 National Household Surveys on Drug Abuse. (DHHS Publication No. (ADM) 92-1906). Washington, DC: National Institute on Drug Abuse.

Himmelgreen, D. A., Pérez-Escamilla, R., Segura-Millán, S., Romero-Daza, N., Tanasescu, M., & Singer, M. (1998). A comparison of the nutritional status and food security of drug-using and non-drug-using Hispanic women in Hartford, Connecticut. *American journal of physical anthropology*, *107*(3), 351–361. https://doi.org/10.1002/(SICI)1096-8644(199811)107:3<351::AID-AJPA10>3.0.CO;2-7

Jeynes, K. D., & Gibson, E. L. (2017). The importance of nutrition in aiding recovery from substance use disorders: A review. *Drug and alcohol dependence*, *179*, 229–239. https://doi.org/10.1016/j.drugalcdep.2017.07.006

Kris-Etherton, P. M., Petersen, K. S., Hibbeln, J. R., Hurley, D., Kolick, V., Peoples, S., Rodriguez, N., & Woodward-Lopez, G. (2021). Nutrition and behavioral health disorders: depression and anxiety. *Nutrition reviews*, *79*(3), 247–260. https://doi.org/10.1093/nutrit/nuaa025

National Center for Biotechnology Information. (n.d.). PubMed Overview. https://pubmed.ncbi.nlm.nih.gov/about/

Neale, J., Nettleton, S., Pickering, L., & Fischer, J. (2012). Eating patterns among heroin users: a qualitative study with implications for nutritional interventions. *Addiction (Abingdon, England)*, *107*(3), 635–641. https://doi.org/10.1111/j.1360-0443.2011.03660.x

Nord, M., et al. 2009. "Household Food Security in the United States, 2008." United States Department of Agriculture. https://www.ers.usda.gov/publications/pub-details/?pubid=41480.

Nunn, R., Parsons, J., & Shambaugh, J. (2020). A Dozen Facts about the Economics of the U.S. Health-Care System. 28.

Rivera, R. L., Maulding, M. K., Abbott, A. R., Craig, B. A., & Eicher-Miller, H. A. (2016). SNAP-Ed (Supplemental Nutrition Assistance Program-Education) Increases Long-Term Food Security among Indiana Households with Children in a Randomized Controlled Study. *The Journal of nutrition*, *146*(11), 2375–2382. https://doi.org/10.3945/jn.116.231373

Ross, L. J., Wilson, M., Banks, M., Rezannah, F., & Daglish, M. (2012). Prevalence of malnutrition and nutritional risk factors in patients undergoing alcohol and drug treatment. Nutrition, 28(7-8), 738-743. https://doi.org/10.1016/j.nut.2011.11.003

SAMHSA. (2020). *Key substance use and mental health indicators in the United States: Results from the 2019 National Survey on Drug Use and Health* (HHS Publication No. PEP20-07-01-001, NSDUH Series H-55). Rockville, MD: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration. Retrieved from https://www.samhsa.gov/data/

SAMHSA. (2021). SAMHSA Announces National Survey on Drug Use and Health (NSDUH) Results Detailing Mental Illness and Substance Use Levels in 2021. Retrieved from https://www.samhsa.gov/newsroom/press-announcements/20230104/samhsa-announces-nsduh-results-detailing-mental-illness-substance-use-levels-2021

Schmitz, J., Kral, A. H., Chu, D., Wenger, L. D., & Bluthenthal, R. N. (2016). Food insecurity among people who inject drugs in Los Angeles and San Francisco. *Public health nutrition*, *19*(12), 2204–2212. https://doi.org/10.1017/S1368980016000306

Shaw, B.A., Agahi, N., & Krause, N. (2011). Are changes in financial strain associated with changes in alcohol use and smoking among older adults? The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences, 66(6), 758-769. doi: 10.1093/geronb/gbr056

Siddiqui, F., et al. (2020). The Intertwined Relationship between Malnutrition and Poverty. Frontiers in Public Health, 8. https://doi.org/10.3389/fpubh.2020.00453

Smyth, Nancy & Kost, Kathleen. (1998). Exploring the Nature of the Relationship Between Poverty and Substance Abuse. Journal of Human Behavior in the Social Environment. 1. 67-82. 10.1300/J137v01n01_05.

St. Joseph Institute. (2018, June 18). Understanding the Relationship Between Poverty and Addiction. Retrieved from https://stjosephinstitute.com/understanding-relationship-poverty-addiction/

United States Department of Agriculture. 2020. "Food Security in the United States." https://www.usda.gov/topics/food-security.

United States Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, Center for Behavioral Health Statistics and Quality. National Survey on Drug Use and Health 2021 (NSDUH-2021-DS0001). https://www.samhsa.gov/data/release/2021-national-survey-drug-use-and-health-nsduh-releases. Published 2023.

World Food Programme. 2018. "Poverty and Hunger." https://www.wfp.org/hunger/poverty.

World Health Organization. 2013. "Malnutrition." https://www.who.int/nutrition/topics/malnutrition/en/.