Nutritional Health, Food Safety and its Social Determinants: A Brief Narrative Review

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Abstract

In its latest report, the United Nations for Food and Agriculture Organization (FAO) pointed out that the number of those who go hungry increased for the third year in a row affecting about 821 million people worldwide in 2018. Moreover, for the most part, studies show that food insecurity tends to follow social trends in such a way that it is precisely population groups in minorities or marginalized who are most likely to be exposed to food shortages and/or lack of access to adequate food. In this scenario, the concepts of food safety and insecurity gain prominence in the international debate playing a role of relevance to global public health. Achieving a healthy and sustainable food model is today one of the main objectives of modern and globalized society. With this, the main objective of this study is to collect in the scientific literature and discuss briefly about the social, environmental and geopolitical determinants that are (or should be) involved in the continuous process of effective human right to adequate feeding.

Keywords: Food safety; Access to food; Public policies.

1. Introduction

Conceptually, food security can be defined as the science of food processing, preparation and storage that: a) aims to ensure constant access to sufficient food in order to provide the energy and nutrients needed to keep human life active and healthy; and, b) assists in the prevention of nutritional origin diseases, such as food poisoning, for example; such diseases, in turn, tend to form acute pathological processes that can be traced back to a toxicological and/or infectious vector (LEROY et al, 2015; RUSH, 2018).

Although the majority incidence of cases of this type that are officially recorded is by accidental ingestion and/or innate allergic complications, a considerable portion originates in toxic vectors (RASTOGI; KISHORE, 1997). In Brazil, for example, in January 2020 was widely covered by local and global media a case of mass poisoning in the State of Minas Gerais by the consumption of beer contaminated with diethylene glycol – a substance that can lead to a nephroneural syndrome and, in severe cases, to death (VEJA, 2020).

At the other end of this concept, food insecurity exists when access is limited or uncertain to nutritionally adequate and safe foods or when you have a limited or uncertain capacity to purchase food in a socially acceptable way. There are several phases of severity, starting with the inability to buy and eat what is wanted, due to the scarcity of resources associated with income (individual and/or family). This includes problems related to food quality, including diversity, safety and nutritional content (MSAKI; HENDRIKS, 2013; CARTER; DUBOIS; TREMBLAY, 2014).

If this persists, it usually goes to the next level which is to reduce the amount and try to prolong food until there is money or lawful and socially acceptable means to acquire more – which can lead to physical hunger. Finally, the most extreme level is the total lack of food (TONTISIRIN; NANTEL; BHATTACHARJEE,

2002; CARTER; DUBOIS; TREMBLAY, 2014).

Além dos elementos da qualidade e da quantidade, na insegurança alimentar são frequentes as queixas de perturbações psicológicas como a ansiedade e o medo de não comer o suficiente, por exemplo. Ademais, podem ocorrer perturbações sociais e familiares pelo uso de padrões alimentares socialmente inaceitáveis ou considerados sub-humanos (ROSE et al, 2010; CARTER; DUBOIS; TREMBLAY, 2014).

2. Food Insecurity and Malnutrition

The concepts of food safety and insecurity should be considered together for public health and for world peace in the short and long term. Very frequent in the 1940s, the argument that the exponential increase in food production in the world would improve quality of life and access to food has not been confirmed by history: the number of people living in poverty without enough food continues to increase year after year (RUSH, 2018). In its latest report, for example, the United Nations (UN) through its division for Food and Agriculture (FAO) has confirmed that the number of those who go hungry in the world increased for the third year in a row affecting around 821 million people in 2018 (FAO, 2018).

Achieving a sustainable food world is therefore one of the main current goals of modern society. The exponential population growth between the years of 1961 and 2000 increased demand for food; which was partially met by a combination of scientific and technological progress, public policies, institutional intervention, business investment, innovation and services. However, the increase in agricultural product intake and exits has a devastating impact on human life and the environment: it is estimated that by 2050 there will be 9.7 billion people and that to properly feed them, considering the current distribution model, it would require an increase of about 70% in food production (COLE et al, 2018; NYANGASA et al, 2019; SCHNITTER; BERRY, 2019).

A global commitment to changes in social, economic, environmental, technological and geopolitical conditions in areas related to food security can positively alter the performance of this sector in the long term leading to a significant impact over the next 20 years. Otherwise, reducing natural resources, the urbanization, growth in megacities, demographic changes and changes in eating habits will have a significant impact on food security. Nevertheless, FAO recently called for transformative changes to be made in agricultural and food systems in the world (COLE et al, 2018; DIÓSZEGI; LLANAJ; ÁDÁNY, 2019).

It is consensus that the main determining factor in food insecurity is the lack of financial resources. A proactive public policy aimed at reducing poverty and protecting vulnerable non-poor people is an important means to meet citizens' needs (STEPHENSON; LATHAM; OTTESEN, 2000). On the other hand, in developed countries such as Canada there is a worrying situation: the social security net is shrinking and increasingly Canadians depend on food banks. Nevertheless, its use was the highest in 2010 and did not decrease in 2011 (CARTER; DUBOIS; TREMBLAY, 2014).

The negative impact of this situation on health underlines the urgent need for intervention. Despite calls for greater involvement of health professionals and government agencies, food insecurity still persists on the global scenario (SCHROEDER; SMALDONE, 2015; ARENAS et al, 2019). Consideration of different levels of the potential social impact of food shortages is consistent with a socio-environmental approach to

understanding public health problems (CARTER; DUBOIS; TREMBLAY, 2014; MORAD et al, 2019).
In this sense, one of the factors that affect access to adequate food is the social geography of the population. Nos In the United States, for example, there is strong evidence of food deserts: there are differences, largely caused by the lack of assistance and government intervention, in access to healthy and affordable food, divided by income and ethnicity, leading to greater food insecurity for the inhabitants of these geographical areas (CARTER; DUBOIS; TREMBLAY, 2014; PENG; DERNINI; BERRY, 2018).
At the other extreme, in larger and traditionally richer locations, the presence of supermarkets is associated with healthier diets; in addition, supermarkets often have lower prices compared to small shops and small suppliers. Food quality can also vary depending on the average income of families living in the neighborhood: areas with high social capital can make it easier for residents to obtain food from neighbors or other institutions in difficult times leading them to act collectively to remedy food insecurity (CARTER; DUBOIS; TREMBLAY, 2014; PHAN et al, 2020). A hypothesis model to explain the associative relationship between socioeconomic factors and dietary consumption, mediated by food retail, was postulated in 2007 by M. White in his work "Food access and obesity" and the graphic representation of this model may be found in Figure 1.

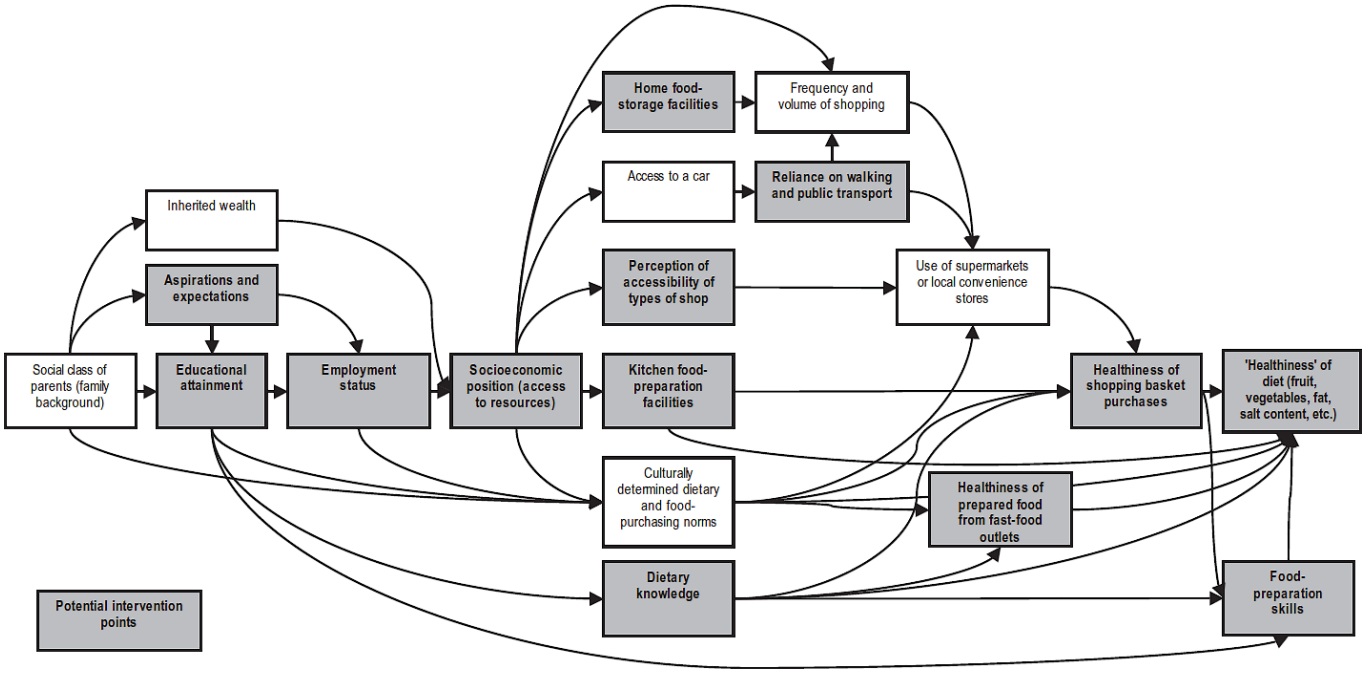

Figure 1. Hypothetical causal model for the relationship between socioeconomic factors and dietary intake, mediated by food retail. *Source: WHITE, 2007. Available at <https://onlinelibrary.wiley.com/doi/full/10.1111/j.1467-789X.2007.00327.x>, access on January 17, 2020.*

Still in the United States, there is evidence that public initiatives such as community gardens can increase fruit and vegetable consumption among the most disadvantaged residents (BRUENING; DINOUR; CHAVEZ, 2017). Therefore, interventions or programs based on the social geography of a region and/or country can significantly increase the availability, accessibility and use of food for the local population, working to reduce individual and/or domestic food insecurity (CARTER; DUBOIS; TREMBLAY, 2014).

3. Food Insecurity and Obesity

The relationship between food insecurity and poor health is directly proportional and persists throughout life affecting several age groups: children in early childhood and those of school age, women of fertile age, as well as adults and the elderly (DHURANDHAR, 2016; MURTHY, 2016). An example of this relationship is that malnutrition, only in the United States, is already a risk factor for 4 out of the top 10 causes of death: cancer, cardiovascular accident, cardiovascular disease and type II diabetes. Food insecurity is also more common among populations lacking in access to health and/or socially marginalized such as people with disabilities and ethnic minorities (SCHROEDER; SMALDONE, 2015; DHURANDHAR, 2016).

In recent years, this axis of research in health sciences has expanded considerably contributing to the establishment of understanding so-called environmental obesity. Originally, this new research area focused primarily on the impact of the artificial and modern environment on physical activity, but has now also begun to study the availability and accessibility of food in family and individual retail (WHITE, 2007).

The study of spatial trends and food availability in restaurants and fast-food chains has revealed that a strong association between obesity and lack of access to a healthy diet in terms of measures such as fruits and vegetables consumption (WHITE, 2007; GUNDERSEN; ZILIAK, 2015).

In the east, for example, high-fat diets and the use of vegetable oil (preferred by the population) has increased risk factors for obesity in the population. At the same time, the introduction of Western fast food chains in China has also contributed significantly to the spread of bad eating habits. Ludwig et al (2001), for example, pointed out that frequent consumption of fast food was directly correlated with weight gain and the risk of insulin resistance over a 15-year period so that, in cohort, subjects who ate fast food more than twice a week gained an additional 4.5 kg of weight and increased their insulin resistance by 104% both at the beginning of the study and in follow-up time, compared to subjects who ate less than one quick meal per week (ASTRUP et al, 2008).

At least four important characteristics are identified in physiological mechanisms that explain why fast food favor weight gain: the presence of abundant portions; high energy density due to high fat content and low energy density of vegetables, fruits and whole foods; the tying sale of soft drinks and sweet drinks; and also, high content of trans fatty acids. It has also been suggested that the high glycemic index of carbohydrates commonly used in these chains may contribute to this scenario. In particular, the average size of portions of burgers, fries, pizzas and soft drinks in fast food have doubled in the last 50 years (ASTRUP et al, 2008; LARAIA, 2013; GUNDERSEN; ZILIAK, 2015).

At the same time, social status, driven by the pattern of beauty, can be associated with low energy consumption and high body metabolic efficiency. Since food insecurity is generally associated with low social well-being, the role of quality of life in determining metabolic efficiency can contribute directly to obesity in disadvantaged populations (DHURANDHAR, 2016). In animals, for example, research shows that dominant rats consume more energy than subordinate rats and are therefore more resistant to obesity in a high-fat diet (TAMASHIRO et al, 2007).

In addition, some experimental evidence suggests that social status can influence not only the use of food calories and its respective metabolic efficiency, but also the energy consumption itself. Studies indicate that

large subordinate monkeys continually consume more energy than dominant monkeys, regardless of whether the diet is rich or low in fat: although both primates prefer a more caloric meal when given the choice, the subordinate monkeys always tend to consume larger quantities, while dominant animals consume, in any situation, just enough to meet their energy needs (WILSON et al, 2008; ARCE et al, 2010). Transacionating the experimental results already proven for the human species, it is notorious and necessary to emphasize that, for the most part, cohort studies show that food insecurity tends to follow social trends: population groups in minorities or marginalized tend to be exposed to less safe situations when it comes to food and, moreover, some indicators point that possibly women, whatever social layer they are, tend to suffer more than men the effects of this sociocultural mechanism (PENG; DERNINI; BERRY, 2018; DIÓSZEGI; LLANAJ; ÁDÁNY, 2019; SCHNITTER; BERRY, 2019). However, since most of these studies are based on the North American population, correlations can vary from country to country. This may be particularly relevant for the postponement of essential medicines and health care, as health systems differ from one high-income country to another less privileged (CARTER; DUBOIS; TREMBLAY, 2014).

4. Conclusion

Since the emergence of Malthusian population theory the world has turned its attention to the food issue, however it is consensus that ensuring security and eliminating situations of food insecurity in the human species is still a complex challenge for modern societies, especially for capitalists ones. A profound political, economic, cultural and social change should be implemented in health systems in the world so that this goal can be achieved. There is no doubt that human health permeates the food issue, but a multifaceted method of interventions will be needed to break the cycle that supports the lack of access to food suitable for a considerable portion of the human population and, in this process, the scientific community plays a key role. The continuous study of this theme, therefore, is necessary for the construction of more inclusive strategies and, nevertheless, to be able to cover all social layers for the urgent reformulation of the model of food production, distribution and consumption in the world.

5. Competing Interests

The authors declare no competing interests.

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