

Different paths towards obesity: Exploring the causes of obesity including the paradox food insecurity – obesity

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Resumo

O conceito de má-nutrição tem sido associado a escassez alimentar, mas nos últimos anos o conceito expandiu-se e passou a incluir a sobrenutrição. Nas últimas seis décadas o número de pessoas com excesso de peso e obesidade disparou, mas as causas continuam de difícil compreensão. Uma revisão sistemática de trabalhos publicados na Medline foi feita com o objetivo de contextualizar o debate sobre a obesidade. Para explicar o aumento do número de pessoas com excesso de peso, inúmeros fatores foram escrutinados, incluindo o paradoxo insegurança alimentar – obesidade. De forma contrastante, cientistas da área das ciências sociais e políticas argumentam que a questão da obesidade resulta mais de um pânico estético e/ou moral e não tanto de uma crise de saúde pública, tal como é apresentada pela Organização Mundial de Saúde. Acima de tudo, as críticas são dirigidas contra as narrativas oficiais que visam a prevenção da obesidade e procuram influenciar as políticas públicas.

Palavras-chave: insegurança alimentar; biopolítica; prevenção da obesidade; fatores bioculturais.

Abstract

Malnutrition has been associated with food scarcity and undernutrition, but in recent years the concept has expanded to include overnutrition. In the last six decades the number of people overweight and obese skyrocketed, but the causal paths remain difficult to understand. A revision of a range of works published in Medline was carried out in order to contextualize the obesity debate. Obesity prevalence soared in the last decades and a myriad of factors have been scrutinized in this text, including the paradox food insecurity – obesity. By contrast, social and political scientists contest whether the obesity issue is more an aesthetical and moral panic than a true public health crisis, like presented by the World Health Organization. Above all, the criticisms are directed to the official narratives of obesity prevention and aim to impact on public policies.

Keywords: food insecurity; biopolitics; obesity prevention; biocultural determinants.

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1. Introduction

Chronic undernutrition was the primary human health problem until late in the 20th century; although presently many people in the world still face famine and remain underweight, in most countries overweight and obese people surpass underweight people. The spread of obesity is still poorly understood, but it is more and more a global problem. In the USA it is estimated that 1 in 3 adults are obese as well as 1 in 6 non-adults. In other countries this scenario is even worse, being particularly acute in several countries in the Oceania region. Nauru, for instance, is believed to be the republic with the biggest percentage of overweight and obese people in the world. In Europe the statistics are not so distant from those of the USA, with obesity being more widespread in Southern regions and less prevalent in Northern regions (Lobstein and Frelut, 2003; Finucane et al., 2011). With a prevalence of overweight/obesity of 31.5%, in 2002-2003, Portuguese children (7-9 years) showed the second-highest mean values in European countries with data available (Padez et al., 2004). When a wider age range (10-18 years) was measured in 2008 the prevalence of overweight/obesity was of 22.5% (Sardinha et al., 2011). Both studies followed the International Obesity Task Force (IOTF) cut-offs.

Obesity emerged in the last decades as a major global concern, with under and over-nutrition co-existing in the same country, local community, family and even individual (Wells, 2012). An individual can be stunted, which may be indicative of less than optimal growing conditions and obese at the same time. In fact, different studies account a possible link between fetal and children undernutrition and obesity in adulthood (Wells, 2012).

Some countries and even some regions of the World (e.g. Latin America and some Asian countries) face nowadays this epidemiological transformation. The majority of these countries are going through an economical transition with strong impacts on nutrition, lifestyles and consequently in health. In India alone, the International Diabetes Federation (IDF) expects that around 100 million people will have type 2 diabetes by 2030 (Shetty, 2012). It is important to underline that diabetes type 2 and obesity are somehow related. It is believed that the sudden adoption of Western food and the lack of physical exercise combined with epigenetic factors to be the reason under the emerging of this “health bomb” scenario in many developing countries. The influence of the epigenetic factors embodies a new proposal to explain obesity that relates the intrauterine environment and their consequences later on in life.

Nonetheless, many other factors (e.g. evolutionary, political, economic, environmental) including food insecurity are considered also partly responsible for the world spread of obesity, in particular, in higher income countries.

The concept of food insecurity was defined in 1996 in the World Food Summit meeting and rests on three main pillars: food availability (includes consistency), access and use (WHO, 2013a).

This article has two main goals. Firstly, we wish to synthesize some recent findings about the causal paths behind the steady increase of the number of people that are overweight or obese in the last 60-50 years, particularly the paradox food insecurity-obesity; secondly, we wish to explore some criticisms of the official narratives about the consequences of obesity and also about the strategies of prevention, put forward by social and political scientists. Our bibliographic review draws from a selection of works published in Medline retrieved by the use of keywords like obesity, overweight, food insecurity, bio-cultural determinants and anthropology. To accomplish these two main goals the article has been divided into six parts: introduction, defining obesity, different paths towards obesity, obesity contested, prevention and final comments.

2. Defining obesity

Overweight and obesity are defined by the World Health Organization (2013b) as abnormal or excessive fat accumulation that may impair health. Adults are classified as overweight if their body mass index (BMI: weight/height²) ranges between 25 and 29.9 and are considered obese if their BMI is greater than 30. In children and adolescents (2-18 years) the definition of cut-off points that can classify the non-adult population according to their weight for height is more problematic. In the United States, the 85th and 95th percentiles of body mass index have been recommended as cut-off points to identify overweight and obesity. According to these standards, defined on a nationally representative survey, non-adults overweight ranges between the 85th and the 95th percentile and over the 95th percentile it is considered obesity (WHO, 2007). The percentiles are calculated for children of the same age and same sex. One of the problems with these criteria is that the percentiles were defined for the USA population. Recently, Cole et al. (2000) tested the application of BMI cut-off points also to non-adults using an international survey of six large nationally representative cross sectional growth studies. The authors proposed a new definition of overweight and obesity in childhood, based on pooled international data for body mass index and linked to the widely used adult obesity cut-off point of 30 kg/m².

The compute of the BMI indicator is far from perfect but has several advantages. It is well known for most practitioners, it is very easy to calculate and, given its simplicity, it is quite accurate in the sense that it is a good proxy

measure of body fat. However, we have to keep in mind that BMI does not distinguish fat from lean tissue nor represents adiposity directly (Flegal et al., 2010). Another question is to know what BMI values should be used as a forewarning sign for developing diseases. Some studies indicate that some populations show different patterns of storing fat so the BMI thresholds may be lower. For instance, in Indians a BMI of 23 could be already problematic (Shetty, 2012). In children this question is even more ambiguous especially among lean children. The cut-off points for underweight still need to be validated as markers of disease risk (Cole et al., 2000). Not only BMI is important but also body type; for instance, it is less of a health risk to accumulate fat around the hips than around the waist (Flegal et al., 2009). In sum, if we want to conduct a more accurate and informative health risk analysis we should include in the studies other body measurements as skinfolds thicknesses and circumferences (e.g. arm, waist and gluteal girth); even if those measurements are highly correlated with each other and with BMI (Flegal et al., 2009).

3. Different paths towards obesity

According to WHO people gain weight if the energy intake is higher than the energy expenditure. The surplus of energy is stored by our body and when maintaining an energy imbalance over weeks, months, years, the extra energy intake is transformed into fat reserves and obesity is the end result. Another explanation is known as the hormone hypothesis which states that obesity is the result of the type of energy consumed (sugar and some carbohydrates), not only calories *per se*.

Traditionally, individual behavior (namely lack of self-control) was considered the main cause of obesity. Overweight and obese people have been much stigmatized (Puhl and Heuer, 2009). There is a perceivable discrimination in variable settings including in the workplace and in other less obvious circumstances like the medical context. Obese people are perceived as morally weak and, more recently, as addicted. The addiction claim was put forward by recent studies that have tried to prove that the brain can become, clinically, addicted to food (particularly sugary food) (Avena et al., 2008; Fortuna, 2012). Nevertheless, the concept of food addiction needs to be further investigated (Ziauddeen and Fletcher, 2013).

Within a given environment we can find people in the full BMI range, which can be input to individual response to different moderators and modulators of energy balance (Swinburn et al., 2011). Personal choices of food, cultural body-size perceptions, sleep quantity and quality, time spend in sedentary activities like playing electronic games and exposure to food clues that

induce an automatic response (McCabe and Ricciardelli, 2001; Chaput et al., 2008; Cunha, 2004; Padez et al., 2009; Carvalhal et al., 2007; Cohen, 2008) are examples.

Still from the point of view of the individual, studies have looked at the effect of physical inactivity on obesity. Maybe, unsurprisingly, in countries like Malta, Portugal, Spain, Italy or England more than 50% of the adults (>15 years or older) are classified as inactive (Hallal et al., 2012) and the respective levels of obesity are very high. Physical inactivity is already considered the fourth principal cause of death worldwide (Kohl et al., 2012). Again, the decision to be more or less active is personal, but it is also dependent on the sport facilities quality and distribution or even the general outdoor environment.

Other main factors besides food and activity practices under investigation were the genetic susceptibility (which is less important than previously thought at the individual level) and, more recently, the possible fetal/infant epigenetic determinants (Swinburn et al., 2011). The epigenetic factors may help to explain the dramatic increase of obesity and metabolic diseases in developing countries. This hypothesis says that a deleterious environment in uterus, such as, maternal undernutrition affects the expression of genes that influence the insulin cycle. The fetus enhances his/her hypothesis of survival using the most of glucose available, but at the same time it induces a strong predisposing for type 2 diabetes and obesity later in life. Using animal models, the scientists were able to prove that maternal undernutrition modifies the genetic makeup of the new born (Horton, 2005) and also that it transcends generations (Lange and Schneider, 2010). In humans the relation between intrauterine conditions and genetics were still under investigation, but the empirical evidences that at least the genetic expression may have been modified are compelling (Heijmans et al., 2008). Although the fetal programming in uterus remains poorly understood, it is believed that undernutrition in gestation, resulting in lower weight at birth may predispose individuals to the later onset of metabolic syndrome or cardiovascular pathologies (Barker, 1995, 1998). Adverse environmental conditions in uterus may induce deleterious programming in several organs like the pancreas, the liver, the muscle and on the adipose tissues. In the context of developing countries, it is hypothesized that caloric overnutrition is increasing rapidly as the result of a recent extended offer of cheap but low-quality food in tandem with a metabolic body favorable to fat storage.

In developed countries the epigenetic factors may not be very important, but the global food system embodies, according to Swinburn et al. (2011), the «obvious possible drivers of the epidemic: the increased supply of cheap,

palatable, energy-dense foods; improved distribution systems to make food much more accessible and convenient; and more persuasive and pervasive food marketing» (p. 807). The relation between food insecurity and obesity is a new arena of research.

Obesity is more common between the lower strata of society, being considered almost a biomarker of social class, but the higher strata are not completely immune. Historically, obesity was a condition of the wealthy, being present, for instance, amongst the European aristocracy of the 18th century. Presently, the relationship between social class and obesity was reversed (Sobal and Stunkard, 1988). Obesity is now more common in the most underprivileged groups of society, like the minorities and black adults in the EUA (Flegal et al., 2002; Flegal et al., 2010; Paeratakul et al., 2002). Why is the correlation between being poor and fatness so strong? Does hunger triggers obesity as Dietz asked in 1995? Several hypotheses have been advanced. Economic factors *per se* seem to favor weight gain, because healthy diets based on vegetables, fruits, fish and lean meats cost more than the more energy-dense diets that are based on processed food based on refined grains, added sugars and fats (at least in the USA) (Cade et al., 1999; Drewnowski, 2004). Famine-feast cycles, because they trigger metabolic dysfunction, can also be a causal factor. Poverty and food insecurity are associated with lower food expenditures, low fruit and vegetable consumption, and lower-quality diets (Drewnowski and Specter, 2004).

Food security, in terms of abundance, safety and regularity, is a quite recent phenomenon, possibly with less than six decades, if we consider most social segments of society. In Portugal, the general living conditions of the population improved only during the 1960's (Padez et al., 2004). But even in developed countries, disadvantaged groups still struggle with food insecurity (Himmelgreen et al., 2000). The concept of food security was defined at the World Food Summit in 1996 and is built on four pillars: availability (sufficient quantities of food available); access (having sufficient resources to obtain appropriate foods for a nutritious diet); use (appropriate use based on knowledge of basic nutrition and care, as well as adequate water and sanitation); and stability (food is available on a consistent basis) (World Health Organization, 2013a; Hadley and Crooks, 2012). Anthropologist have, traditionally, investigated the problem of food hunger in Africa (Mindz and Du Bois, 2002), but more recently Pottier (1999) published an influential book about food insecurity and since nutritional anthropologists devoted more research time to it, both in the USA and elsewhere (see Himmelgreen et al., 2000). During the last

decade, the number of empirical work about food insecurity increased and some recent review articles were published (e.g. Hadley and Crooks, 2012).

In the United States, 2004, food insecurity without hunger was experienced by almost 8% of households and a further 3.9% experienced food insecurity with hunger. For households with children the scenario was worse, as 17.0% were food insecure without child hunger, and <1% were food insecure with child hunger (Nord et al., 2004). In 2015, the households reporting food insecurity increased to 12.7% and from those, 5.0% had very low food security. Almost 8% of households with children report food insecurity (Coleman-Jensen et al., 2012).

Although several studies report an association between adult obesity and food insecurity (Martin and Ferris, 2007), particularly in women (Dinour et al., 2007), the exact mechanism responsible by the apparent paradox food insecurity-obesity is not known. Several hypotheses have been proposed: an infancy of poverty, low-cost of energy-dense foods in comparison with whole foods options, cycles of feast and famine that disrupt the metabolic system [in some cases are provoked by the Food Stamp Programme], and psychological and behavioral changes (e.g. stress, depression, physical limitations) (Dinour et al., 2007, pp. 1957-1958). Body weight outcome of food insecurity differ whether the study was undertaken in a low or high-income country. In lower income settings, without safety net programs, food insecurity among women is associated with lower body mass index, while the opposite (higher body mass index) is more common in higher income settings (Hadley and Crooks, 2012).

As expected the countries with less obesity are also considered the most social and economic equal and with a more inclusive welfare regime (Wilkinson and Pickett, 2006). This can be related to the perception of present and future security and insecurity (Offer et al., 2012). Looking at inequality an even at political regimes represents a new mindset to understand obesity. Wells (2012), on a recent review, analyzed the consequences of capitalism on obesity. According to the author: «what distinguishes capitalism in particular is its dominant role in the modern world, its unusual capacity to impact simultaneously on people in distant global regions through structural relations of inequality» (p. 268). Globalized capitalism promotes undernutrition in some regions of the world more dedicated, for instance, to the production of monocultures that rely on a cheap and abundant labor force and overnutrition in other regions.

Biological anthropologists have analyzed obesity from an evolutionary perspective. Increasing rates of obesity across the world are broadly attributed

to environments that are obesogenic, against an evolutionary heritage that is maladaptive in these new contexts (see Ulijaszek and Lofink, 2006 and Ulijaszek, 2007 for a synthesis on the evolutionary causes). The main argument states that we have developed biological mechanisms to have a great drive for food and to store energy as fat, but we have not evolved mechanisms to protect ourselves from extra calories intake because it was not a challenge present in our past. Along with our great appetite, we are size blind. If we are served more quantity of food we simply eat more (Ello-Martin et al., 2005). Our body has evolutionary mechanisms that save us in food shortage periods, but we do not have the same protection in periods of food abundance. Humans are wired to respond to environmental cues, and because the environment changed, and is now saturated with food cues, we overeat without being aware (Cohen, 2008). Cohen describes 10 neurophysiological pathways that can lead people to make food choices subconsciously or automatically.

Albeit it is generally correct that an imbalance between energy intake and physical activity results in overweight, the problem of obesity is extraordinarily complex. In order to explain how obesity is now the new global 'epidemic', transversal to developed and developing countries alike, scientists with very different academic backgrounds are analyzing a myriad of factors. It is not the aim of this article to analyze them all (an impossible task). Instead, we prepared a review of, commonly considered, significant causes including the paradox food insecurity – obesity.

4. Obesity contested

So far, we have synthesized the official narrative disseminated by the World Health Organization (and other international organizations) and the mainstream literature that describe obesity as a global epidemic that threatens global wellbeing (e.g. Kopelman, 2000). Official sources also argue that it is to the public best interest that governments implement measurements to defeat weight issues. However, increasing voices, mainly from the social and political sciences, are questioning whether obesity panic should be considered more as a moral and/or aesthetical panic instead of a health crisis (Evans, 2007; Fonseca and Ferreira, 2015). Above all there is a growing critique towards official and mass media narratives about obesity. Obesity is presented in the press, mainly as a morality fault, as if people could not control their instinct for food. As if people could not control their hedonic and addicted brain.

To begin with, we can question if we can be obese and healthy, but the answer is not simple. Depends on how long an individual has been obese, what is its genetic makeup, what is its level of physical activity and, based on more

recent studies, what are the influences of the intrauterine life. Recalling the title of the article from Blair and LaMonte (2006) about obesity, the relation between overweight and wealth does not call for a black and white answer but comes on shades of grey. The association between weight and mortality is not linear, instead it assumes more “curvy” shapes. It can assume a U-shaped curve as Campos et al. (2006) describes or even a J-shaped curve (Thorogood et al., 2003). Both studies report an increased tendency to mortality in people with a very low BMI ($BMI < 18.5 \text{ kg/m}^2$). Campos et al. (2006) underline that in most of the National Health and Nutrition Examination Survey (NHANES) cohorts, the relative menaces associated with underweight were greater than those associated with even high levels ($BMI = 35$) of obesity.

The National Center for Health Statistics, USA (2012) has published in its website that obesity increases the risk of many health conditions, including the following: coronary heart disease, stroke, and high blood pressure; type 2 diabetes; cancers, such as endometrial, breast, and colon cancer; liver and gallbladder disease; sleep apnea and respiratory problems; degeneration of cartilage and adjacent bone within a joint (osteoarthritis); reproductive health complications such as infertility; and mental health conditions.

However, Campos et al. (2006) stress out that there is only scientific proof connecting obesity and osteoarthritis for the weight bearing joints, as well as connecting it to certain cancers related to the production of estrogens. Even the cause-effect relation between obesity and type 2 diabetes has been contested. We can question that if the correlation between obesity and health risks is not that clear, why then was there such a scientific and popular turmoil around the theme, judging by the huge number of scientific and non-scientific texts about obesity. Having a BMI of 30 is not equivalent to contract a deadly virus (Campos et al., 2006). Saguy (2012) defends that public discussions of the “obesity crisis” do more harm than good, leading to bullying, weight-based discrimination, and misdiagnoses. Even more worrisome, Saguy claims in his article that the IOFT is being financed by the pharmaceutical industry, in order to create demand on top of the “obesity epidemic” panic and cash in the profits. Campos et al. (2006) also bring attention to the economical interests involved in obesity panic.

Biopower is a very pertinent concept when studying aspects of humans related to biology. Biopower is a concept developed by Michel Foucault in the 1970's which means the governance and regulation of individuals and populations through practices associated with the body (Foucault, 1984). Race, population and reproduction, and genomic medicine are aspects very commonly studied under the analytic umbrella of biopower (see Rose and Rab-

inow, 2006). Obesity by its biocultural nature is also a perfect empirical candidate and in fact after 2005 some studies have been published about this topic. In 2009, Wright and Harwood coordinated a book entitled *Biopolitics and the "obesity epidemic": governing bodies* full dedicated to this theme.

The so called urge to control the obesity "epidemic" can be seen as the maximum expression of biopower. Parr (2002, p. 373) notices that health is never simply "health"; instead it can easily become a tool to moralize, normalize and regulate. Obesity official discourses are the perfect example of an attempt to moralize and normalize life by the state. The panic of obesity places the individual under constant and official surveillance, but also pressures individuals towards increasingly self-monitoring. The distress related to obesity dominates all; some, because they are already overweight and others because they fear to become (Wright and Harwood, 2009). As Wright (2009) asserts: «in a neoliberal and performative culture where individuals are expected to be responsible not only for their own health but for striving for perfection in all aspects of their lives, including the weight and appearance of their bodies. To be fat... is evidence of failure» (p. 6).

Despite all that, is state growing interference on personal lifestyles like food or physical habits, even if it is to promote health, legitimated? People have accepted, with minority voices against, the legal initiatives to prohibit tobacco in public closed places and the Portuguese government is announcing a future law to prohibit smoking in private cars whenever children are present. Presently, the new governmental battle seems to be shifting from tobacco to overweight and obesity, but some authors are already defending the end of the obesity epidemic rhetoric (Gard, 2011), not because people will suddenly become slim, but because the supposedly "epidemic" will disappear from the public agenda. According to Gard (2011) despite apocalyptic predictions, evidence suggests that obesity rates are levelling off in Western societies (preliminary data indicate that it is levelling off in Portuguese children, Gama personal communication), life expectancies continue to raise in line with rising obesity rates, and across the world policy-makers have remained largely indifferent and inactive in the face of this apparently deadly threat to our health and well-being. In part, this inertia is due to the fact that it is impossible to establish an objective "truth" on which to base policy and because the hypothesis of success are very sparse.

The obesity contestation literature summarized above is itself contested. Kim and Popkin (2006), for instance, produced a commentary to Campos et al. (2006) article refuting their main arguments. They say that Campos et al. selectively examine the literature and defend that treating a real health prob-

lem as non-existing is equally irresponsible as blaming the victims only. They quote a vast number of scientific articles that show clearly that obesity is a real global problem, because of the huge number of people affected (approximately 2 billion) from all over the world (except for a few countries from sub-Saharan Africa and Asia) and because of the serious health consequences.

5. Prevention: what can be done?

Although it is more or less consensual that prevention focused on promoting health life styles is needed, the terms of the preventive narrative is getting more and more critics from different arenas. This fact leads us towards the discussion triggered by the called “obesity sceptics”, who wonder, as refer to above, if there is real health consequences of being overweight or obese and if the official narrative causes more harm than good.

Obesity prevention and educational campaigns have almost exclusively targeted the individual with all the psychological and stigmatized drawbacks associated. Thus, many scholars are discussing that probably only a global prevention program with a paradigm shift directed to improve self-esteem on individuals, but above all that promote environmental changes (economic and political) will bring positive results (e.g. O’Dea, 2005; Kim and Popkin, 2006).

Investment on medical developments are expected to solve the possible health outcomes of obesity like heart failure or type 2 diabetes; additionally important is the support regarding prevention programs to educate the general population about healthy life styles but even these combined measures are still an incomplete approach. We need to dive deeper into the problem. For instance, a common and popular solution is based on education. Governments were called to support prevention programs designed to inform children (and adults) about healthy life styles. Other preventable measurements included increase taxes on unhealthy foods, as it was done in Denmark and Portugal, or ban some products, for instance, trans-fats from restaurants and processed food. Other possible solution could be a stronger governmental intervention on food industry regulation, but this will interfere with very strong economic groups. The article by Mark Hujer with the title “What potatoes say about the state of US democracy” published in *Spiegel Online*, on August 17, 2012 is very enlightening of the power of economical lobbies in the EUA. President Barak Obama formulated new guidelines about food served in school cafeterias. He wanted to have more vegetables served to students and limit pizza or French fries to only one serving per week, but these guidelines were blocked in the Congress. The article ends with a very clear sentence: «the short-term

profits of potato farmers are more important than the long-term goal of public health.» The Portuguese government published in 2012 a guideline to be implemented in schools cafeteria where the food items were divided in three blocks: food items to be promoted, food items to be limited and food items not to be offered (Ladeiras et al., 2012).

Recently, the mayor of New York banned large sugary beverages sold in restaurants, movie theatres and street carts. Opponents like the industry spokesman Stefan Friedman said, in an interview on the New York Times from May 30, 2012 that these proposals just distract from the hard work that needs to be done on the obesity issue. But other authors, like the evolutionary psychologist Daniel E. Lieberman (2012) remember «we have evolved to need coercion». Food industry is just taking advantage of our natural appetite for sugar and fat food, having large profits with the sales. The profits belong to industries and private companies alone, but the negative side effects are socialized.

As we have said previously, the regular use of certain substances (like sugar) can be addictive in some circumstances (Fortuna, 2010; Avena et al., 2008). Caffeine and glutamate are other substances systematically addicted to processed food. Glutamate is responsible for the fifth basic flavor umami, which intensifies the natural taste of food and also contributes to increase appetite. Cumulatively, we know that presently virtually every processed product has a kind of sugar, including the less obvious like bread or salty products. The combination of these two facts can constitute the grounds on why it is possibly a good practice to control food industry. Other authors say, however, that the human body cannot distinguish from natural or artificial sugars, so sugar is not the main problem. For instance, Deremsky (2004) hypothesis is that poor households consume more dense foods because they cannot afford healthier diets. As far as the problem remains economical, campaigns designed to promote nutritional awareness and to convince people to eat more vegetables or fruits will not have success. Swinburn et al. (2011) say crudely that so far no country can act as a public health exemplar for reduction of obesity and type 2 diabetes. It is defended in this text, and I quote, that «policy interventions for obesity can only be realistically directed at the environment (making healthy choices easier) rather than the individual (compelling them to take the healthy choices)» (p. 810). Because food marketing techniques use our inner cognitive mechanisms that we are not aware of to reach their commercial goals and because the health consequences of overeat are serious, Cohen (2008, p. 1772) even says that «the marketing techniques should be considered in the same light as the invisible carcinogens and toxins in the air and

water that can poison us without our awareness». No need to say that Cohen calls for a societal response with stricter regulation addressing food cues, food availability, portion sizes, and advertising.

6. Final comments

Without a great desire for food, humans would not have survived and this basic assumption makes the obesity problem simple and difficult to understand at the same time. If we ingest too much calories (or the “wrong” calories) we put weight, and we do have a “natural” drive to ingest calories. However, in order to better perceive the global dimension of the obesity phenomena, we need to add a myriad of factors; not only individual but also environmental. It is important to try to understand the individual drive for food, and most crucial for tasty and caloric food, but we also urgently need to recognize the influences of the environment in a broad sense, even political and economic regimes, on the obesity epidemics.

To unravel children overweight and obesity causes is even more urgent because of physical but not least important psychological consequences. A quote of Gabriela Mistral, posted on the site of WHO (2012), about children growth and malnutrition clearly summarizes the urge to deal carefully with the problem of overweight from early ages. She wrote: «we are guilty of many errors and many faults, but our worst crime is abandoning the children, neglecting the foundation of life. Many of the things we need can wait. The child cannot. Right now is the time his bones are being formed, his blood is being made and his senses are being developed.»

From an evolutionary standpoint, it is in the best interest of humans to have an inherent desire for food, but this need may go awry and government may be called to take action. But the “action” must primarily target the individual or the environment? It is not fair to submit individuals to a very stigmatized and moralized discourse while at the same time allowing very aggressive food marketing. Obesity is dangerous to the body, but as several studies have revealed, the official discourse around obesity can be dangerous to the mind. The self-desire to conformity and to act in cultural consonance is deeply embodied in the human being causing suffering and health problems by themselves on those who fail to adjust. The rule, “first, do no harm” makes perfectly sense in the context of obesity prevention. Campaigns aiming to promote nutrition awareness will remain ineffective as long as people cannot afford to buy healthier foods and as long as marketing techniques continue to induce unconscious responses. Doing nothing is not an option even if the relation between weight and health is not linear. We have an inherent desire for

food, conjugated with an absence of biological mechanisms that prevent over-eating. The private sector is eager and effective in exploiting the basic human biological desires and weaknesses. Preventive campaigns and governmental actions must be very well designed in order to not provoke more harm than good. The promotion of programs that effectively decrease food insecurity among adults, above all in women, and reinforce the regulation of the food system including marketing, may be effective policies for obesity prevention.

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