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COMMENT

A plan to attenuate hunger and obesity: killing two birds with one stone

Jalal Hejazi[1]

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Abstract

Aim Obesity and hunger are two of the most important health problems worldwide. In many developing countries, both of these conditions exist. The main reason for obesity is calorie intake that exceeds energy expenditure, and insufficient calorie intake is the main cause of hunger. The aim of the present manuscript is to introduce a plan for attenuating both of these problems.

Methods According to this plan, as a first step, overweight and obese participants are invited to reduce 25% of their calorie intake by subtracting a quarter of their usual portions. As the second step, a non-governmental organization (NGO) collects the separated raw materials (from households) or foods (from restaurants) at specific time intervals. The third step is the identification of the undernourished people and asking them to participate in the program. Social media will have a crucial role in this context.

Conclusion Every society can benefit from this program. It will not impose any extra financial burden on the participants or governments.

Keywords Poverty · Overweight · Social media · Caloric restriction

Introduction

According to the latest report from the FAO, there are nearly 800 million under nourished people worldwide from which more than 98% are living in developing countries (FAO 2015). FAO defines undernourishment as the caloric intake of below minimum dietary energy requirement. Undernutrition may result in very serious consequences; Black and colleagues have reported that maternal and child undernutrition is the underlying cause of 3.5 million deaths, 35% of the disease burden in children under 5 years, and 11% of total global DALYs (disability-adjusted life years) (Black et al. 2008). Chronic nutrient depletion leads to retardation of skeletal growth in children; this lost linear growth is never fully regained (Hoddinott et al. 2013). Chronic undernutrition can have drastic effects on mental development and school achievement, and lead to behavioral abnormalities in children. Undernutrition can also have long-lasting physiologic effects such as insulin resistance in adulthood, hypertension, and dyslipidemia (Martins et al. 2011). Apart from the serious consequences for a person's health, the economy can be also affected by undernutrition, because the poverty both directly, through a loss of productivity due to poor physical condition, and indirectly, through poor cognitive function and learning deficits, can hinder economic development (Martins et al. 2011). Furthermore, undernutrition increases health expenses.

On the other hand, according to the latest report of the WHO, there are more than 1.9 billion overweight or obese adults in the world. Of these, over 600 million are obese (World Health Organization 2017). Obesity is not considered as a high-income country problem anymore. In a study by Mendez et al., the investigators concluded that the number of overweight women exceeds the underweights in most developing countries (Mendez et al. 2005).

Overweight/obesity is the third leading risk factor for preventable deaths in the United States, and the second leading risk factor for those under 70 years old (Danaei et al. 2009). Obesity increases the risk of non-communicable diseases including ischemic heart disease, stroke, Type 2 diabetes, cardiovascular disease, osteoarthritis, and endometrium and large intestinal cancers, and it is considered a health crisis worldwide (Pi-Sunyer 2009).

The coexistence of undernutrition and obesity is seen in many developing countries. A fundamental cause of obesity and overweight is energy intake being higher than energy expense, and the main reason for undernourishment is the lack

✉ Jalal Hejazi
j.hejazi@zums.ac.ir

[1] Department of Nutrition, School of Medicine, Zanjan University of Medical Sciences, P.O. Box: 4517713433, Zanjan, Iran

of enough energy intake — and these conditions exist in many countries. As a result, it can be concluded that if overweight and obese people take in less calories and these extra calories go to the undernourished population, two major health problems (under nutrition and obesity) in many developing countries will be solved. However, it may seem very simplistic and idealistic to ask obese people to eat less and give their food to undernourished people.

Recent advances in communication,and especially emergence of social media, have made many of the impossibilities possible, particularly in terms of charity activities. A good example for the exceptional role of social media in these sort of activities is the "Ice bucket Challenge". The aim of this phenomenon was promoting awareness and gathering funds for amyotrophic lateral sclerosis (ALS). ALS is a rare disease with a prevalence of about 5.40 cases per 100,000, and this challenge was able to involve more than 3 million donors and raised 110.1 million dollars just in the USA (Gualano et al. 2016).

Nearly half of the world's population are facing obesity or hunger problems, so this situation has the potential to attract much more attention specially if the participants do not have to donate any money. A possible plan to attenuate obesity and under nutrition problem could be as follows: let's call this effort the

"Quarter of My Plate Challenge".

Statement of the program

The first step in this challenge is to ask obese and even normal weight people to reduce their food intake by 25%.

The calorie requirements of an individual depend on many factors including age, sex, body size, physical activities, etc., but estimated average requirement (EAR) of energy in adult males and females is about 2500 Kcal/d and 2000 Kcal/d respectively (Trumbo et al. 2002). Theoretically, a restriction of 7000 Kcal/weeks or 1000 Kcal/d energy can result in a 1 kg weight reduction each week (Pi-Sunyer et al. 1998). As a result, if someone eats 25% less food, assuming that his/her calorie consumption is in line with EAR, he/she would lose weight up to 3 and 2 kg/month respectively for males and females. If the usual calorie consumption of the individual is more than EAR (as it usually is in obese people), by subtracting a quarter of his/her food, he/she would lose more weight. Of course, this trend of weight reduction will be attenuated over time because of a reduction in basal metabolism rate (BMR) (Leibel et al. 1995), but by doing so an individual could lose at least 10% of body weight (Lefevre et al. 2009).

Weight reduction and calorie restriction have numerous beneficial effects, not only in overweight and obese people but also in individuals of normal weight as well. Weight loss is associated with a clinically relevant reduction in blood pressure, improvement in cardiac function, and reduction in cardiovascular events and type 2 diabetes prevalence. Weight loss can also significantly relieve pain and improve function in patients with osteoarthritis (Rueda-Clausen et al. 2015). There is also considerable evidence that calorie restriction can slow down the aging process (Fontana 2009). An easy way to reduce calorie intake up to 25% is separating a quarter of usual food or food ingredients. Of course, dietary guidelines such as "my plate" as developed by USDA should still be met after this calorie reduction.

The second step is related to the "quarter of my plate". There is a requirement for an NGO to collect the 'quarters'. In many developing countries, many people are still eating most of their meals at home. Collecting and transferring of prepared food from houses is difficult because of the spoilage risk. Thus, women and mothers, who usually make most of the meals for the family, have a key role in this program. They know the amount of raw materials they need for preparing a meal and can easily separate a quarter of them. Then the volunteers who want to participate in this program should be registered by the responsible NGO, and the NGO should collect the separated foods at some specific interval, for example once a week. A city could be divided into seven areas, and each day of the week the food could be collected from one area. There is also a need for a place for preparing and serving of the food. Public places such as churches, mosques, city halls, etc., could be suitable for this purpose, especially if they are located in less affluent parts of cities. All the required activities for preparing and serving of the food could be done voluntarily. Restaurants could also join the program. Already, some restaurants all over the world give the opportunity to their customers to help poor people under terms such as "pending coffee" or "suspended meal". A suspended meal is a meal which people pay for in advance, to be provided for those that request it later. However, in the "Quarter of My Plate Challenge" there is no need to pay extra money. The customer can ask the restaurant to serve a quarter less than its usual portion size and donate that part to the program, and at the end of each day the restaurant can give these foods to the NGO.

The third step in this project will be the identification of the undernourished people and asking them to participate in the program. Health service providers and charities usually have lists of needy people, and these lists could be a good point to start and be completed by local requests from participants over time. Disabled undernourished people and older people could need special attention, and the NGO should have special facilities to deliver food to this population.

Social networks can play a crucial role in accomplishing this program. They will have a very important role in connecting the people to this program and its promotion. The way that this program is promoted and introduced to

people has a particular impact on its success, thus celebrities, media activists, politicians, and others can play a very important role in this context.

Evaluation

The nutritional status of both groups (food donors and food receivers) can be assessed using anthropometric methods (e.g., BMI, mid-arm circumference, etc.), and standard questionnaires such as a food frequency questionnaire at the beginning of the program and at specific time intervals (for example, after 1 month, after 6 months, and after 1 year) used to evaluate success of the program.

Implications

This program could have several benefits for any community. By participating in this program, obese and normal weight people can lose weight and benefit from the above mentioned effects. It will not impose any extra financial burden to the participants or governments. All the individuals who donate their food or participate in the volunteer activities in this program can enjoy the serenity of assisting those who need their help, and of course the most important goal of the program is to attenuate the hunger problem.

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Compliance with ethical standards

Conflict of interest The author has no conflict of interest to declare.

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