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Review Article

Eating Out of Home and Risk for Obesity: An Overview

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Abstract

Despite Mediterranean dietary pattern has become a healthy eating standard, even Mediterranean countries such as Italy, show a progressive disaffection from this diet in parallel to the increasing trend in prevalence of body overweight and obesity and correlate pathologies.

The causes that led to the explosion of the body overweight and obesity phenomenon and the differences in the prevalence of this condition among various social groups, are cultural and economic as well as biological and epidemiological.

In developed countries out-of-home eating, defined as the consumption of foods and beverages out of home, has received increasing attention among cultural and behavioral factors linked to obesity. Indeed, with the rapid development of economy, diet habits have undergone great changes.

An increasingly number of people, especially in urban settings, is eating out of home not only for working people during their lunch break, but also at dinnertime. Studies showed that a very high dietary energy content of both full service and fast-food restaurant meals is a widespread phenomenon and that there is a positive relationship between the consumption of food away from home and weight gain.

This has garnered considerable attention from public health experts in formulating national policies and programs designed to curb the growing trends in obesity. USA, Canada and Australia, proposed calorie-labeling policy that required chain restaurants to post the calorie content of items on menus. In Europe, there is not such a policy yet. Unfortunately, many studies show that menu restaurant calories and nutritionallabeling mandatory policies did not have achieved the set goals in guiding consumers throughout restaurant menu to choose healthier dishes in terms of less calories and nutrients composition.

Probably, educational and information campaigns are factors to put beside calorie and nutrient labeling.

Keywords: Obesity; USA; Nutrient

Introduction

Obesity and its comorbidities (i.e. metabolic syndrome, cardiovascular diseases, diabetes) are an increasing health problem capable to damage nations due to high hospitalization rates, treatment costs and impaired quality of life [1-3]. Indeed, from 1999–2000 through 2015–2016, a significantly increasing trend in obesity was observed in both adults and youth in USA where the prevalence of obesity was 39,8% in adults and 18,5% in young in 2015-2016 [4]. As a consequence, the United States, the only case among developed countries, is beginning to experience a decline in life expectancy at birth in some states. A recent study has shown that in states such as Mississippi, Arkansas, Kentucky, Tennessee, Oklahoma, Alabama and Louisiana, there is a progressive decrease in life expectancy, especially of women, among which there are the

higher rates of obesity and smoking. In Mississippi, in particular, the state with the highest obesity rate, life expectancy is only 67 years for men and 74 years for women [5]. Although Italy had a life expectancy at birth of 83,244 years in 2017, second in the world only to Japan, according to data from the World Bank [6], indicators of malnutrition due to food excess and lifestyles changes predict a reversal of this tendency. Indeed, parallel to USA, the prevalence of obesity has tripled since the 1980s in many countries of the European Region according to the World Health Organization (WHO) [7]. In Italy the prevalence of obesity was 10,9% and the prevalence of overweight was 31,6% in the general population in the time period 20152018 according to the health surveillance system PASSI of the Italian National Institute of Health (ISS, Istituto Superiore di Sanità) [8]. Among young and teenagers Italians, 5 to 19 years old, the prevalence of overweight is 37% according to data from WHO and ISTAT [7,9]. Obesity in young people is a form of malnutrition known for its association with obesity in adult age and with the chronic-degenerate pathologies correlated to obesity [10]. Furthermore, the doubling in average life expectancy in the last 100 years [11], has brought to a significantly increase in the percentage of elderly people (older than 65). In Italy, it has increased from 4% in 1900 to 20.6% in 2010 and this percentage should reach 34% in 2050. The same growth trend in the percentage of elderly people is occurring worldwide [12].

In western country, approximately 80% of people over-65 today is afflicted by at least one chronic disease, while approximately 50% of people is afflicted by two or more chronic diseases [13]. Often senile diseases are associated with bad dietary habits and lifestyle already existing at a younger age. It is well established that both body weight increase due to an excess of calories intake and an unhealthy diet for quality and nutrients composition accelerate aging and increase risk for or exacerbate a range of diseases including cancer, stroke, heart disease, diabetes and mental illness [14-20]. Thus, with the projected increase in global life expectancy and the concomitant growth in the incidence of chronic diseases as a direct consequence of the increase of the elderly population, there is a call from international and national health organizations and policy makers for implementing actions that would diffuse awareness on importance of a healthy diet to shift population food consumption toward healthy habits.

Indeed, the decreasing levels of primary prevention, such as promoting healthy diet patterns and healthy lifestyles, in the fight to obesity could contribute to make the health system economically unsustainable even for the National Public Health Service (INHS) of Italy, one of the world's highest ranked for ability and quality of healthcare in relationship to the resources invested [21].

Recently, studies have put emphasis on examining the role of diet in health as a composite of multiple nutrients and foods. We eat foods, not nutrients, and the combination of foods may be more synergistically powerful for health than any specific food or nutrient alone [22-24]. According to that, since the study of Ancel Keyes that first noted the association between dietary patterns in Mediterranean regions and lower rates of heart disease in the Seven Countries Study of 1958 [25], the Mediterranean dietary pattern has become a healthy eating standard transferable world wide to nonMediterranean countries as well. According to the concept that the beneficial health effects of the Mediterranean diet lies primarily in its synergy among various nutrients and foods rather than on any individual component, many recent studies have shown that it is able to prevent a range of chronic diseases and slow down aging in people having adopted it [26-33]. The Mediterranean diet pattern is more than just a healthy diet in the area where it was culturally born, like the central and south part of Italy. It is a healthy life style involving a set of skills, knowledge, rituals, symbols and traditions concerning crops, harvesting, fishing, animal husbandry, conservation, processing, cooking, and particularly the sharing and consumption of food [34], at a point that the Mediterranean diet was inscribed on the Representative List of the Intangible Cultural

Heritage of Humanity by the United Nations Educational, Scientific and Cultural Organization (UNESCO) in 2013 [35]. Despite that, even Mediterranean countries such as Italy, as well as Greece and Spain, show a progressive disaffection from the Mediterranean diet [36-38] in parallel to the increasing trend in prevalence of body overweight and obesity and correlate pathologies, according to the data previously described above [7-9].

In this review we have made an overview of the changes in eating habits in the population, in particular the causes that lead to the changes. We will try to understand if eating out-of-home causes

weight gain in and if something has been proposed at the level of programs to curb the growing tendencies towards obesity.

Eating in and eating out of home: habit changes in the population food consumption.

The causes that led to the explosion of the body overweight and obesity phenomenon and the differences in the prevalence of this condition among various social groups, are cultural and economic as well as biological and epidemiological [39]. Factors such as the level of education, income and social position seem to be crucial to an individual's likelihood of becoming obese [40]. In developed countries out-of-home eating, defined as the consumption of foods and beverages out of home, has received increasing attention among cultural and behavioral factors linked to obesity. Indeed, with the rapid development of economy, diet habits have undergone great changes. An increasingly number of people, especially in urban settings, is eating out of home not only mandatory for working people during their lunch break, but also increasingly at dinnertime, with substantial dietary changes with passive overconsumption of energy despite the neurobiological processes controlling food intake.

The 2015 Nielsen Global Out-of-Home Dining Survey polled more than 30,000 online respondents in 61 countries to understand consumers' out-of-home dining behaviors and preferences [41]. It provides a perspective on the habits of only existing internet users, not total populations. Thus, in developing markets where online penetration is still growing, respondents may be younger and more affluent than the general population of that country. Even with these limitations, the trend appears very clear: global respondents are avid out-of-home diners, with nearly half (48%) saying they eat out weekly or more often; lunch and dinner are the meals that consumers most frequently eat away from home, but breakfast may represent a growth opportunity in some markets; quick-service and casual restaurants are the most preferred eating establishments and food quality and price are the most important factors when choosing an out-of-home dining establishment [41]. In Italy, the expenditure on food away from home is increased of 5.7% between the years 2008 and 2018 reaching 36% of the global food expenditure in 2018. Between 2001 and 2018 the average annual growth rate of demand in the restaurant industry was 0.6% [42]. A survey research on a sample representative for the entire Italian population by CATI (Computer Assisted Telephone Interview) and CAWI (Computer Assisted Web Interview) administered between the 11th of November and the third of December 2019, shows that 32.7% of the sample cook lunch and 53% cook dinner at home everyday. The 64.3% of the sample declares to get his breakfast out-of-home; 67.6% has his lunch out-of-home at least twice a month week time and 10.4% says to get lunch out-of-home every day. More than 27% of respondents claims to have lunch out-of-home more times in 2019 than in 2018. 62.5% of respondents claim to have dinner out of home at least twice a month, with 18.5 % that has dinner 3 or 4 times a week and 5.6 everyday [42]. In Italy, full day working people have mandatory their lunch out-of-home during the lunch break at work. According to welfare index PMI 2018, 8.1% companies have canteens where full time employees may have their lunch. 8.3% of the companies offer lunch to their full time employees at outside partner canteens and restaurant [43]. 10.5% of companies offer meal ticket to their full time employees. In absolute numbers, 2.4 millions of Italians have used meal tickets in 2017. 70% of company employees, which received meal tickets, used them to have lunch at affiliated cafeteria and restaurants [44].

Eating out of home. Nutrition characteristics of food choices and association with weight gain in the population

Healthy diet patterns, as the Mediterranean diet, are easier implemented at home dining then at out-of-home dining. Great amounts of studies examine the nutrition characteristics of eating in a variety of different dining places out of home. Indeed, many studies seem to associate eating at food outlets and leisure places and "on the go" with less-healthy food choices and average body weight gain in the general population [45-48]. Specifically a British study examining the energy content of main meals served in major UK restaurant chain shows that the average energy content of main meals served in both fast food and full service restaurants in the UK is higher than public health recommendations [49]. In USA, a multisite randomized study came up with the same conclu-

sion. Both non-chain restaurants and large-chain restaurants serve amounts of energy that are typically far in excess of human energy requirements for single eating occasions [50]. A multi-country cross sectional study analyzes energy content of frequently purchased restaurant meals globally in five different countries across all continents and compare them to USA restaurant meals. This study shows that a very high dietary energy content of both full service and fast-food restaurant meals is a widespread phenomenon [51]. Foods prepared and/or consumed away from home are higher in total fat, saturated fat, and trans fatty acids in comparison with foods prepared at home [52-54]. Thus, as many studies in the literature report that eatout-of-home food is usually both high in energy content and irrespective of reference recommendation for healthy nutrient intakes, the question is whether or not eating outside of the home environment on a frequent basis may be associated with weight gain both in young and adults. Although many methodological differences among the studies performed up to date currently limit the ability to make comparisons, majority of data in the literature suggest there is a positive relationship between the consumption of food away from home and weight gain.

Substantial out-of-home eaters (SOH), defined as individuals who consume on average at least 25% of their daily energy out of home, are associated with a more adverse dietary profile in a study investigating out-of-home eating in Belgium. Specifically both the total daily energy intake and the energy density of daily food consumption are higher for SOH eaters than for non-SOH eaters [55]. This finding corresponds with observations from studies examining the influence of eating location on the diets of both adult and young Irish population [52,56]. Data from a study aimed to compare adult Norwegians SOH with NSOH (non-substantial out-of-home eaters) regarding to the nutritional quality of their diet, show SOH eaters had a higher energy intake, a higher percentage of energy from sugar and a lower fiber intake than NSOH eaters. Thus, eating location is significantly associated with the nutritional quality of the diet [57]. A Spanish dynamic cohort study confirms that eating-out consumers (two times or more per week) have higher average adjusted weight gain per year then NSOH. These observations suggest that as a result of recent socio-economic changes the rapid increase of away-from-home meal consumption, may play a role in the current obesity epidemic observed in some Mediterranean countries [58]. A crosssectional analysis in the context of the European Prospective Investigation into Cancer and Nutrition study (EPIC- PANACEA study) has examined association of body mass index (BMI) and weight gain with eating at restaurants or eating at work among 10 European countries. The analysis has found a significantly association of eating at restaurants and at similar establishments with a higher body mass index among men [59]. Thus, observational studies seem to indicate a prevalence of weight gain among SOH eaters both in north European countries and in Mediterranean ones despite their differences in food culture and traditional diet. This would suggest that eating out-ofhome per se determines the observed average gain in weight. If that is true, we should record a similar phenomenon all over the world despite cultural, social and culinary tradition differences among nations considering that the increase in obesity is a global phenomenon. Indeed, this seems to be the case. A Chinese longitudinal survey study analyzes the consequences of Food Away From of Home (FAFH) consumption rising in rural and urban China. This study shows that the frequency of meals consumed away from home had a significantly positive effect on BMI in urban China, where as no significant association was observed in rural China [60]. The observed urban–rural difference are explained as result of a different amount of surplus energy due to the different labor intensity among rural and urban residents. Thus, socio-economics changes that combine spread of sedentary works and out-of-home food consumption have an impact on gain of weight and obesity. Indeed, a cross sectional-study on urban Shanghai adults confirm previous data showing that eating out is associated to an increase in daily total energy intake and to a poor diet quality [61]. Conversely, eating takeaway food or eating at sit-down restaurant seems not be related to the prevalence of adult obesity in Australian rural communities [62]. In USA, the mean energy content of individual meals offered by non-chain restaurants, which account for approximately 50% of restaurant locations in the United States, is equivalent to 66% of typical daily energy requirements, with 7,6% of the meals providing more than 100% of typical daily energy requirements [50,63]. As a consequence of that, a study on the Wisconsin State population highlights that participants, who reported eating frequently at either fast-food restaurants or sit-down restaurants, were more likely to have higher BMIs [64]. Another study focus its analysis on young American adults with a mean age of about 25 years, that frequently eat out of home, with one third eating food from a fullservice restaurant, one third from a sandwich shop and one third from fast-food restaurant. The young adults who frequently eat food from burger-and-fries fast-food restaurants are at increased risk for overweight/obesity and poor dietary intake [48]. Indeed, many studies on the USA population confirm that either fast-food or full-service restaurant consumption is associated with higher daily total energy intake, poorer dietary indicators, and weight gain [65-71].

Policies and programs towards FAFH designed to keep back the growing obesity trends

Recent shifts in eating patterns favoring eating out compared to eating at home have garnered considerable attention as public health experts pursue potential targets for national policies and programs designed to curb the growing obesity trends [72-75]. Environmental approaches that address sources of excess energy are a promising option to address the obesity epidemic. Thus, some countries, specifically USA, Canada and Australia, have implemented calorie-labeling policy that required chain restaurants to post the calorie content of items on menus, menu boards, and item tags. First in USA, the New York City's Health Department amended the city Health Code to require the posting of calorie counts by chain restaurants in 2006. The opposition of restaurants deled its enactment, it was implemented in January 2008. After that, several state and local jurisdictions passed their own menu labeling laws before that USA Congress imposed menu-labeling requirements on chain restaurants as part of the federal health care reform bill signed into law in March 2010. The U.S. Food and Drug Administration delayed implementation of the law several times until it went into effect on May 7, 2018 [76-80]. In Europe, there is not such a policy, neither at European Union level nor at state level. UK government has encouraged catering chains to provide in store kcal information in 2011. But voluntary policies have not resulted in an adequate kcal labeling in the UK eating out of home sector. Thus, UK government is considering the introduction of legislation to make kcal labeling mandatory among catering chains [81].

Policymakers have based decision to enforce calorie-labeling policy on studies showing that most consumers are unaware of the high levels of calories, fat, saturated fat, and sodium found in many menu items [69,82,83]. Thus, provision of nutrition information on restaurant menus could potentially have a positive impact on public health by reducing the consumption of less-healthful foods. At the same time mandatory implementation of calorie-labeling policy may induce restaurant industry to offer less energy-dense foods with an increase in overall nutritional quality of items offered [84,85]. Since first implementation of mandatory restaurant menu kcal labeling in NYC, many studies have assessed the impact of such a policy on guiding consumer choices towards more equilibrated and less caloric Items on restaurant menu. The first question to be examined, it has been the accuracy of stated energy contents of foods purchased in restaurants following implementation of restaurant menu calorie-labeling policies. One study measured dietary energy in food from 42 restaurants. The restaurants were randomly selected from quick-serve and sit-down restaurants in some USA states between January and June 2010. Authors found a correspondence between the absolute stated energy contents of menu items and the absolute measured energy contents for most of the food items analyzed. However, there was a substantial inaccuracy for some individual foods [86]. After that studies focused on assessing effects of mandatory labeling policies on energy content of food purchased at restaurants by consumers. Some studies detected a positive effect on the energy content of food purchased in full-service restaurants [87-89] but others studies instead did not detected any effect in fast-food restaurants [90,91]. Since adolescent tend to often eat out, especially at fast-food restaurants, a study has focused on gathering qualitative information from adolescents regarding the use of menu labels when eating out. Although the majority of participants were knowledgeable about menu labeling, they reported rarely noticing menu labels at eating establishments. When they noted it, menu labeling did not affect food purchasing decisions except for girls from highincome families, pointing out to the importance of social and cultural factors in successful of menu labeling policies [92].

Furthermore calorie-labeling menu policy in chain seat-down restaurants seems not to have had effects on total calories or serving size of items on the menu both in Canada and Australia [78,93]. In the USA Washington State, it has been reported a modest decrease in energy, saturated fat and sodium contents in the entrée that were on the menu of sit-down restaurant at 18 month following the implementation of mandatory menu labeling compared to 6 month. Even if overall levels of energy, saturated fat and sodium remain excessive [94]. Thus, the evidence regarding menu calorie-labeling appears to be mixed, showing that labels may reduce the energy content of food purchased in some contexts, but have little effect in other contexts. Demographic characteristics and consumer preferences are important determinants in the use of posted calorie information as well as it could be important to change the menu labeling format using a simple traffic light system along with presenting calorie information in the form of physical exercise equivalents [92,95]. Indeed, many restaurant customers may not be knowledgeable about the correct range of recommended caloric intake, thus seeing a number of calories next to a food item did not have any meaning for them.

Future healthy eating actions towards restaurant industry

Many studies show that menu restaurant calories and nutritional-labeling mandatory policies did not have achieved the set goals in guiding consumers throughout restaurant menu to choose healthier dishes in terms of less calories and nutrients composition. Certainly, calories statement needs to be matched with nutritional fact labeling and percentile of calories daily value referred to the recommended daily calorie intake for greatest effectiveness. Even so, that further nutritional information could not be enough to change consumer out-of-home food habit. Educational and in-

formation campaigns are factors to put beside calorie and nutrient labeling. As well as psychological and environmental determinants that guide restaurant menu items choices need to be taken in account. Calories and nutrients composition labeling needs to be communicated in a more efficacious and appealing way that can be immediately understood in its healthy befit. On the other side, studies in the literature have also shown that mandatory restaurant menu-labeling policies do not seem to have induced restaurant industry to offer less energy-dense foods with an increase in overall nutritional quality of offered items. In Europe, there is not such a mandatory calories and nutrition menu-labeling policy neither at country level nor at European Union level. Nevertheless, in Europe the share of people eating out of home is increasing likewise in the countries in which the mandatory policy has been enforced. Thus, strategies aimed both to promote healthier food choices among restaurants patrons and to induce restaurants to improve nutritional quality and to reduce calories amount of items in their food menu, need to be implemented. Since interventions along these lines need to be adopted voluntary by restaurant industry, they need to be perceived as marketing improvements able to enlarge restaurants market by meeting consumers' needs. In Mediterranean countries, as Italy, eating pleasure, interest in regional e local products and cooking recipes as well as an atmosphere of conviviality, are important factors in determining food choices. Studies have identified both rational aspects, such as cost, healthiness, constraints, weight control and special diets, and aspects related to emotions, like taste, pleasure, habits, hunger and convenience as determinates of consumers food choices [96-98]. Since determinants of food choices are multiple, interrelated and complex, efforts focused on just communicating about rational determinants of food choices such as health attributes and energy density of foods, are not enough to change consumers habit as previously shown with restaurant menu labeling policies. Thus, nutrition interventions should address this complexity [99]. Some authors have argued that automatic emotional processes, which are at the root of food choices, are determining factors in the experience of eating pleasure [100]. Considering that pleasure seeking is an important factor in food choice [97,98], social marketing programs aimed to encourage healthy eating at serving restaurants need to be integrated with the concept of food pleasure to have chances to succeed [101]. Up to now the European Union program Fighting Obesity Through Offer and Demand (FOOD) is the only ten years (2009-2019) public project that has targeted both consumers, identified as employees in the industry that mandatory have to eat out-ofhome at lunch break, and the categories of personnel in the restaurant business that plan, cook and serve the food items in the restaurant menu to promote healthy eating in European countries, included Italy [102,103] The project FOOD starts from an educational strategy aimed at promoting health eating by tacking actions direct both towards consumers at work places, who are made aware of healthy and balanced nutrition principle, and towards restaurants to improve the nutritional quality of the food offered in their menu [104]. Thus, the FOOD program, being a public/private initiative, it brings together different stakeholder which is very important. Building a virtuous cycle between the demand of healthy food from restaurant and the offer of healthy food by restaurant. A questionnaires survey directed at both target groups, employees and restaurants, commissioned within the framework of the FOOD program highlights how the employees/consumers declare they would like to have a restaurant close to their work places offering balanced food and they would appreciate nutritional information about the menu items easy to understand and to put in practice. Restaurants owners, managers and chefs, on the other hand, are aware of the new demand for healthier food and are eager to meet their customers' demand even if restaurant owners have little time and little budget to take action and chefs are open to suggestions but not to big changes in composition and preparation of the food items offered [104]. In Italy interview survey conducted by DOXA in 2018, reveals that Italians, who eats out at least once a month, do it in search of physical and mental wellness, eating pleasure, discover new and innovative recipes and flavors. They are interested in the quality and origins of menu items ingredients with a preference for zero KM organic seasonal ingredients.

Conclusion

The restaurant could develop technological innovations with smart digital menu at the table able to guide consumers choices throughout the different types of displayed dishes according to different personal needs tacking in account food intolerances and allergies. Thus, customize meals instead to order items straight from the menu seems to be the new restaurant patrons demand trend [105].

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