Out-of-home eating frequency, causal attribution of obesity and support to healthy eating policies from a cross-European survey

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ABSTRACT

BACKGROUND: The relation between the increased out-of-home food consumption and the rising of overweight and obesity prevalence rates has been widely assessed, and the key role played by the catering sector in ensuring healthy food choices has been recognised. Governments' healthy eating policies have a wide range of action, influencing consumer behavior, and the socioeconomic and food environments, with specific interventions for the catering sector. Information on the public support for policies could help planning decisions. This study aims to investigate the relationship of out-of-home eating frequency with beliefs about obesity causes, support to healthy eating policies, and with sociodemographic factors.

METHODS: Data on 3003 individuals from Belgium, Denmark, Italy, Poland and United Kingdom, of both sexes, aged ≥16 years, were employed from the European survey on policy preferences (Eatwell). Data were analysed through Chi-square test and logistic regression analysis.

RESULTS: Respect to UK respondents, Italians were more likely to eat out at lunch and dinner, and 60% less likely to eat pre-packaged meals; Belgians less likely to eat fast food (61%) and pre-packaged meals (36%); Polish less likely to eat pre-packaged meals (41%); Danish less likely (about 50%) to eat out for dinner and to eat convenience food. Females were less likely to eat out at lunch (31%), and to eat pre-packaged meals (41%). Younger people were more than 4 times as likely to eat out at lunch as the elderly, and about 3 times as likely to eat out at dinner and eat convenience food. Those attributing obesity to genetics were twice as likely to eat convenience food. Attributing obesity to lack of willpower was associated with reduced likelihood to eat fast food (64%) and to eat ready meals (52%). Attributions of obesity to lack of time, and to lack of self-control were associated with increased likelihood to consume fast-food (95%) and pre-packaged meals (85%) respectively. Out-of-home eating people expressed higher support for information-based prevention, and actions aimed at healthier out-of-home eating, and lower support for restrictions and regulations of the food supply environment.

CONCLUSIONS: Future research on out-of-home food consumers and their support towards public interventions for the catering sector, could have important implications for effective strategies to promote healthy eating.

Key words: out-of-home eating, obesity attribution, healthy eating policy, public support

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DOI: ***10.2427/9921***

Accepted on 5 May, 2014; Published as Online First on 15 December, 2014

INTRODUCTION

Eating out of home and consuming ready-prepared food have been increasing during the last decades in industrialized countries as a result of social, cultural and environmental changes [1].

Official statistics and recent studies have reported the growing importance of enterprises providing food and beverages consumer service activities in European countries [2-4]. Several researches documented that out-of-home eating is correlated with higher dietary intake or poor nutritional intake not only in Europe [5-9] but also in the USA [10] and Australia [11]. The relation between the increased out-of-home food consumption and the rising of overweight and obesity prevalence rates has been assessed in studies conducted worldwide [10-14].

Given the growing importance of out-of-home consumed food in modern life, the catering sector plays an important role in ensuring healthy eating. The World Health Organization (WHO) fully recognized the key role of catering sector in food provision and emphasized the governments' action in ensuring this sector recognises its responsibility in making healthier food choices available for consumers [15,16]. From a review of national nutrition policies that include specific actions for the catering sector [17], it emerged that strategies developed for the catering sector are mainly directed towards labelling of foods and prepared meals, training of catering staff and advertising, while there is lack of strategies aimed at ensuring the affordability of healthy out-of-home eating or to enhance accountability of stakeholders.

A review of healthy eating policies in Europe and their evaluation was carried out under the framework of the EC funded project Eatwell [18-20] and the first multi-country European survey was conducted to measure public acceptance and willingness to pay (through taxation) for different policy measures. Policy makers' big issue in planning healthy eating policies is to know whether or not they meet the public support, and to identify interventions that are more accepted by society, especially in those countries with a public health system where the costs are borne by taxpayers [21,22]. In a recent work carried out under the Eatwell project a higher acceptance emerged for healthy eating education in schools and for compulsory labels with nutrient information for all foods, and lower acceptance for nutritional standards on workplace meals and other restrictive measures on the food market environment, like bans on advertising for junk food and on vending machines in schools [23]. The cited study confirmed that beliefs about obesity causes are predictor of the support for healthy eating policy, as demonstrated in previous studies [21,24,25], and in particular, that people who ascribe obesity to the food supply environment are very supportive of market regulation policies [23].

To date, to our knowledge, there are no European researches that focused on determining the attitudes towards obesity causes and healthy eating policies of habitual out-of-home food consumers versus non-habitual consumers, which, given the importance of the catering sector in food procurement, could help to identify the barriers to the effectiveness of the interventions.

The aim of the present study is to investigate the relationship of out-of-home eating frequency with causal attributions of obesity and support to healthy eating policies, sociodemographic factors and BMI outcomes, employing individual data from the European survey on policy preferences conducted under the Eatwell project.

METHODS

The reported analyses are based on data from a cross-sectional survey carried out in 2011 in the framework of the EC funded project Eatwell, a European wide investigation of the issues surrounding nutrition policies and obesity [18].

Study design and data

Stratified samples by age, gender and region were randomly extracted in five European countries, Belgium (n=600), Denmark (n=600), Italy (n=600), Poland (n=600) and the United Kingdom (n=603), from the proprietary panel of the GFK NOP market research agency. The total sample included n=3003 individuals of both sexes, aged ≥16 years. The questionnaire was web-administered, included 47 questions building on and extending the questionnaire by

Oliver and Lee [21], and was structured in three main sections: demographics and lifestyle; views about health risks and governments actions; household economic conditions and views about costs of health and taxation. Selected items were considered for the present study which focused on eating out frequency, sociodemographics, overweight and obesity rates and health, public attitudes towards obesity determinants and support to prevention policies.

Sociodemographic and health variables

Selected demographics were gender, age, marital status and education. Participants self-reported their highest level of education and the responses from different countries were classified into low, medium and high. Self-reported height and weight were used to calculate the Body Mass Index (BMI) as (kg body weight)/(m^2 body height), and participants' overweight and obesity conditions were assigned for BMI values from 25.0 to 29.9 and ≥ 30.0 respectively. Perceived health was assessed by the question *How is your health in general?*

Eating out variables

Participants were asked four questions to assess their eating out habits: *How many days each week do you eat out at lunchtime (anywhere, including workplace or university school canteen meals)?, How many days each week do you eat out for your evening meal?, How many days each week do you eat out in a fast-food restaurant?* and *How many days each week do you eat pre-packaged or prepared meals such as takeout dinners?* The response categories were: *never, less than once a week, 1-2 times a week, 3-5 times a week, 6 or more times a week.*

Items on obesity attribution and policy acceptance

Subjects were asked the extent of agreement with 12 statements about why people become overweight (A1-A12 in Table 3). Six items were extracted from Oliver and Lee [21] related to genetics, environmental and individual factors, and six additional items reflecting other factors associated with poor diets, lack of time, discounting future health consequences, affordability of healthy foods, availability of and easy access to unhealthy foods, and lack of information to make healthy choices [26]. Three items were about the role of governments in protecting public health (B1-B3 in Table 3). Support for healthy eating policies was measured through 20 statements (C1-C20 in Table 3). Agreement was measured on 5-point Likert scales, *1.strongly disagree, 2.disagree, 3.neither agree nor disagree, 4.agree, 5.strongly agree.*

Statistical analysis

The bivariate associations between each of the four eating out variables and the demographic and health variables were tested by contingency tables and Pearson's Chi-square test. All the selected factors, including items on obesity attribution and policy acceptance (Table 3) were used as independent variables in four separate logistic regression models-backward stepwise method (using $p<0.05$ as the threshold for removing a variable from the models), with four eating out variables as dependent variables: *(1) frequency of eating out at lunchtime, (2) frequency of eating out for the evening meal, (3) frequency of eating at fast-food restaurant* and *(4) frequency of eating pre-packaged meals.* For the logistic analysis purpose, dependent variables' responses were dichotomized into *never/less than once a week* and *1 or more times a week;* responses to the items in Table 3 were recoded into three categories, *disagree, neutral,* and *agree.* The independent variables retained after stepwise backward method were mutually adjusted. A p value < 0.05 was considered as statistically significant in all the analyses above described. SAS software version 9.2 was used for all statistical calculations (SAS Institute Inc., Cary, NC, USA).

RESULTS

Descriptive characteristics of the study sample, by country, are reported in Table 1. Significantly lower percentages of ≥ 65 year olds were observed in Poland and in Italy, which also reported the lowest percentage of young people aged 16-24 years. Participants

TABLE 1

DESCRIPTIVE CHARACTERISTICS OF THE SAMPLE IN THE FIVE EUROPEAN COUNTRIES

	UK	ITALY	BELGIUM	POLAND	DENMARK	TOTAL
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
GENDER						
MALES	293 (48.6)	289 (48.1)	293 (48.9)	287 (47.8)	295 (49.1)	1456 (48.5)
FEMALES	310 (51.4)	311 (51.9)	307 (51.1)	313 (52.2)	305 (50.9)	1547 (51.5)
AGE*						
16-24	68 (11.2)	51 (8.4)	104 (17.3)	104 (17.4)	92 (15.3)	418 (13.9)
25-44	205 (34.0)	221 (36.8)	166 (27.7)	215 (35.9)	170 (28.3)	977 (32.5)
45-64	257 (42.6)	282 (47.0)	233 (38.8)	253 (42.1)	244 (40.7)	1269 (42.2)
≥65	74 (12.2)	46 (7.7)	97 (16.2)	28 (4.6)	94 (15.7)	339 (11.3)
MARITAL STATUS*						
MARRIED/COHABITING	371 (61.6)	367 (61.1)	349 (58.2)	399 (66.5)	340 (56.7)	1827 (60.8)
SINGLE OR ANY OTHER STATUS	232 (38.4)	233 (38.9)	251 (41.8)	201 (33.5)	260 (43.3)	1176 (39.2)
EDUCATION LEVEL[a]*						
LOW	86 (15.0)	86 (14.4)	105 (18.0)	67 (11.1)	68 (11.8)	412 (14.1)
MEDIUM	247 (42.9)	338 (57.1)	223 (38.1)	288 (48.0)	225 (39.2)	1321 (45.1)
HIGH	242 (42.1)	169 (28.5)	257 (43.9)	245 (40.9)	281 (49.0)	1194 (40.8)
BMI[a]*						
NORMAL WEIGHT	247 (43.0)	329 (57.6)	255 (4.3)	257 (46.1)	245 (44.1)	1333 (47.8)
OVERWEIGHT	199 (34.6)	180 (31.6)	173 (32.9)	202 (36.2)	204 (36.7)	958 (34.4)
OBESE	129 (22.4)	62 (10.9)	99 (18.8)	99 (17.7)	106 (19.1)	495 (17.8)

[a]Values for this variable do not equal the overall n because of missing data

* Characteristic differed by country, Pearson's Chi-square test, p value < 0.05

were predominantly married/cohabiting (60.8%), the highest rate of married people was observed in Poland, the lowest in Denmark. Overall, a medium level of education prevailed (45.1%), the lowest rate of high educated was observed in Italy (28.5%), the highest in Denmark (49.0%). 34.4% of the total sample resulted overweight, and 17.8% obese. The highest rates of obese were observed in UK (22.4%) and in Denmark (19.1%), the lowest in Italy (10.9%).

A descriptive analysis of the association between eating out habits and socio-demographic and health factors for the total sample is presented in Table 2. 32.5% ate out at lunch once or more per week, 14.8% at dinner, 6.2% at fast-food outlets and 14.1% ate pre-packaged meals. The bivariate analysis showed that eating out did not differ significantly by gender, except that males were more used to eat take-away food.

The highest rates of eating out at lunchtime ≥3 times a week were observed in Denmark (23.2%) and in Italy (21.3%), the lowest in UK (9.5%). In Italy considerable percentages of subjects ate out for the evening meal on a regular basis (25.6%, 1-2 times a week) this habit was less common in the other four countries. The highest rate of eating take-away food 1-2 times a week was observed in UK (15.0%), the lowest in Denmark (7.6%).

Eating out habits significantly varied with age, marital status and BMI. Younger respondents (aged 16-24 and 25-44 years) and singles were more used to eat out, and to eat convenience food (fast-food and ready-prepared food) than elderly and married/cohabiting people respectively. The percentages of respondents who ate out, or ate convenience food once or more times per week, were higher among normal weight than among overweight and obese.

Moreover, the percentages of people who ate out at lunchtime once or more times per week increased with increasing level of education. Respondents who perceived a bad

TABLE 2

EATING OUT FREQUENCY BY SOCIO-DEMOGRAPHIC CHARACTERISTICS AND HEALTH CONDITION

		EATING OUT AT LUNCHTIME (ROW%)			EATING OUT FOR EVENING MEAL (ROW%)			EATING AT FAST FOOD RESTAURANT (ROW%)			EATING PRE-PACKAGED MEALS (ROW%)		
	(%)	< 1 TIME A WEEK	1-2 TIMES A WEEK	≥ 3 TIMES A WEEK	< 1 TIME A WEEK	1-2 TIMES A WEEK	≥ 3 TIMES A WEEK	< 1 TIME A WEEK	1-2 TIMES A WEEK	≥ 3 TIMES A WEEK	< 1 TIME A WEEK	1-2 TIMES A WEEK	≥ 3 TIMES A WEEK
GENDER[d]													
MALES	48.5	67.2	14.2	18.6	86.0	10.8	3.2	93.3	5.4	1.3	84.2	12.3	3.5
FEMALES	51.5	67.8	13.8	18.4	84.4	13.7	1.9	94.3	4.8	0.9	87.6	9.4	3.0
AGE CLASS[a,b,c,d]													
16-24	13.9	52.7	22.8	24.5	78.1	18.0	3.9	85.9	11.0	3.1	77.6	17.4	5.0
25-44	32.5	59.9	15.7	24.4	80.1	15.7	4.2	91.3	7.1	1.6	81.9	14.6	3.5
45-64	42.2	72.8	11.3	15.9	89.2	9.7	1.1	97.0	2.8	0.2	89.8	7.3	2.9
≥65	11.3	87.7	8.3	4.0	93.4	5.1	1.5	98.7	0.7	0.6	93.4	4.7	1.9
COUNTRY OF ORIGIN[a,b,c,d]													
UK	20.1	72.4	18.1	9.5	87.8	10.9	1.3	93.2	6.3	0.5	81.2	15.0	3.8
ITALY	20.0	61.1	17.6	21.3	70.3	25.6	4.1	90.4	7.2	2.4	87.6	9.1	3.3
BELGIUM	20.0	67.2	11.9	20.9	86.1	12.1	1.8	96.3	2.5	1.2	85.0	12.0	3.0
POLAND	20.0	69.9	12.4	17.7	88.5	7.6	3.8	91.2	7.8	1.0	85.7	10.2	4.1
DENMARK	20.0	66.8	10.0	23.2	93.2	5.2	1.6	97.9	1.8	0.3	90.2	7.6	2.2
MARITAL STATUS[a,b,c,d]													
SINGLE/OTHER STATUS	39.2	60.7	17.0	22.3	80.5	15.8	3.7	90.8	7.4	1.8	80.0	14.9	5.1
MARRIED/COHABITING	60.8	71.9	12.1	16.0	88.2	10.0	1.8	95.7	3.6	0.7	89.7	8.1	2.2
EDUCATION LEVEL[a]													
LOW	14.1	76.5	10.1	13.4	89.2	8.0	2.8	93.9	4.3	1.8	88.6	7.5	3.9
MEDIUM	45.1	69.2	13.5	17.3	84.2	13.0	2.8	92.8	6.0	1.2	85.7	10.6	3.7
HIGH	40.8	62.0	16.1	21.9	84.5	13.2	2.3	94.6	4.6	0.8	85.0	12.2	2.7
BMI[a,b,c,d]													
NORMALWEIGHT/ UNDERWEIGHT	47.8	64.0	16.2	19.8	82.0	15.1	2.9	91.8	7.1	1.0	84.2	11.6	4.2
OVERWEIGHT	34.4	68.6	12.7	18.7	85.7	11.8	2.4	95.1	4.5	0.4	86.3	11.6	2.1
OBESE	17.8	74.7	11.5	13.8	92.8	6.2	1.0	97.5	1.9	0.6	90.4	7.1	2.5
PERCEIVED HEALTH STATUS[b]													
BAD	8.4	69.9	13.8	16.3	89.8	6.5	3.7	93.0	4.6	2.4	84.2	11.8	4.0
FAIR	32.5	67.6	14.2	18.2	86.8	10.8	2.4	93.0	5.9	1.1	84.3	11.6	4.1
GOOD	59.1	67.1	13.9	19.0	83.7	13.8	2.5	94.3	4.8	0.9	87.0	10.2	2.8
TOTAL	100	**67.5**	**14.0**	**18.5**	**85.2**	**12.3**	**2.5**	**93.8**	**5.1**	**1.1**	**85.9**	**10.8**	**3.3**

[a]Character significantly varied by frequency of eating out at lunchtime, [b]Character significantly varied by frequency of eating out at for dinner, [c]Character significantly varied by frequency of eating out at fast-food, [d]Character significantly varied by frequency of eating take-away food

health status resulted less used to eat out for the evening meal.

Table 3 shows the distribution of agreement/ disagreement for obesity attributions and

TABLE 3

OBESITY ATTRIBUTION AND POLICY SUPPORT STATEMENTS
(FREQUENCY DISTRIBUTIONS OF RESPONSES FOR THE TOTAL SAMPLE, %)

	DISAGREE	NEUTRAL	AGREE
A. STATEMENTS ABOUT WHY PEOPLE BECOME OVERWEIGHT			
A1. There is too much unhealthy and fatty food in restaurants and supermarkets	11.6	28.8	59.5
A2. Being overweight is something you inherit from your parents	34.4	37.6	27.9
A3. Most diets are not very effective	15.9	26.3	57.9
A4. Most people lack the willpower to diet or exercise regularly	4.7	15.2	80.1
A5. Most overweight people don't view their weight as a problem	21.4	26.8	51.8
A6. Most people are overweight because they are simply born that way	60.7	27.0	12.3
A7. People who eat too much junk food do so because it costs much less than healthy food	31.6	26.1	42.3
A8. Most people lack the money to eat healthy diets and exercise regularly	35.2	22.1	42.7
A9. Most people are overweight because they don't have time to prepare healthy meals	39.4	25.2	35.4
A10. Most people are overweight because there are too many snack foods readily available in workplaces, shops and homes	17.3	21.8	60.9
A11. Most people are overweight because they lack information about healthy eating and/or health risks of excess weight	30.8	28.3	40.9
A12. Most people are overweight because they value more immediate satisfaction compared to future health risks	7.7	19.0	73.4
B. STATEMENTS ABOUT THE ROLE OF GOVERNMENT IN PROTECTING PUBLIC HEALTH			
B1. Our government's policies take too much care of people and deprive them too much of individual responsibility	43.4	28.7	27.9
B2. I feel it is less intrusive if post, phone-calls, text messages or e-mails I get are connected with government health campaigns than those from commercial product adverts	20.8	38.0	41.1
B3. The government should play a more active role in protecting overweight people from discrimination	25.9	35.3	38.8
C. STATEMENTS ABOUT GOVERNMENT INTERVENTIONS			
C1. The government should ban advertising for junk food and fast food that is aimed at children	14.0	20.8	65.3
C2. The government should ban advertising for junk food and fast food that is aimed at adults	23.4	31.9	44.7
C3. The government should spend money for information campaigns informing people about the risks of unhealthy eating	12.5	22.8	64.7
C4. Education to promote healthy eating should be provided in all schools	4.0	9.9	86.1
C5. The government should subsidise firms which provide programmes to train their employees in healthy eating	19.4	29.8	50.8
C6. All foods should be required to carry labels with calorie and nutrient information	4.5	13.4	82.1
C7. All restaurants should be required to provide calorie and nutrient information in menus	19.2	28.9	51.9
C8. The food industry should cooperate in financing governmental campaigns that promote healthy eating	11.5	21.2	67.2
C9. The government should award companies for healthy food innovations	11.5	23.1	65.4
C10. The government should impose taxes on unhealthy food and use the proceeds to promote healthier eating	20.0	23.5	56.5
C11. The government should subsidise fruit and vegetables to promote healthier eating	8.8	19.7	71.5
C12. The government should provide vouchers to low-income families to buy healthy foods at reduced prices	15.9	23.0	61.2
C13. Vending machines should be banned from our schools	21.3	29.5	49.2
C14. The government should regulate the nutritional content of school meals	11.9	23.1	65.1
C15. The government should regulate the nutritional content of workplace meals	25.5	32.8	41.7
C16. The government should work with the food companies to improve the nutritional content of processed foods (e.g. less salt or fats)	8.7	21.4	70.0
C17. The government should impose on food companies limits on certain ingredients (e.g. salt or fats) to improve the nutritional content of processed foods	13.1	23.1	63.8
C18. TV-stations should give free air-time to governmental campaigns that promote healthier eating	14.1	26.0	59.8
C19. There should be public measures like free home delivery to support easier access to healthy foods for the elderly and those with lower incomes	12.4	24.3	63.2
C20. VAT rates should be lower for healthy foods and higher for unhealthy foods	13.4	17.9	68.7

governmental policies. Respondents largely agreed about causes of obesity related to individual willpower (A4, A12). Agreement prevailed for attributing overweight to the easy availability of unhealthy food and snack food (A1, A10), to ineffectiveness of diets (A3), and to fail in recognizing overweight as a health problem (A5). Large disagreement was observed for A6. *Most people are overweight because they are simply born that way*. Respondents' opinion was divided on causes of obesity related to lack of time, lack of money and lack of information (A7, A8, A9, A11).

The role of government in protecting public health received relatively less support. Large agreement was expressed towards most of the governmental interventions aimed to tackle obesity. The highest agreement was observed for C4. E*ducation to promote healthy eating should be provided in all schools* and *C6. All foods should be required to carry labels with calorie* and *nutrient information*. Less agreement was observed for banning advertising for junk food aimed at adults and banning vending machines in schools (C2, C13). The regulation of nutritional content of workplace meals received the lowest support (C15).

Table 4 presents results of logistic regression analysis. Analysis refers to the total sample, since there were inadequate cases, when the analysis was performed by country. Models included only independent variables retained after applying backward stepwise method. After adjusting for potential confounding factors, we observed that females were 31% less likely to eat out at lunchtime, and 41% less likely to eat pre-packaged meals than males. 16-24 year olds and 25-44 year olds were more likely (3 times or more) to eat out and to eat pre-packaged meals than ≥ 65 year olds; 45-64 year olds were 3 times as likely to eat out for lunch as ≥ 65 year olds. Subjects who reported a low (medium) level of education were 59% (29%) less likely to eat out at lunchtime respect to high educated participants. The likelihood to consume lunch outside the home was positively associated with good (perceived) health status. Non-obese subjects were about twice as likely to eat out at dinner, and to consume convenience food as obese. Singles were more likely to eat out, both at lunch (47%) and at dinner (64%), and to eat pre-packaged meals (68%).

There was a significant association between nationality and frequency of eating out. Respect to UK respondents, Italians were 50% more likely to eat out at lunchtime and 3 times as likely to eat out at dinner regularly, and were 60% less likely to eat pre-packaged meals; Belgians resulted less likely to eat fast food (61%) and pre-packaged meals (36%); Polish were 41% less likely to eat pre-packaged meals; Danish resulted about 50% less likely to eat out for dinner and to eat take-away food, and 67% less likely to eat at fast food outlets.

Attributing obesity to the lack of willpower was associated with reduced likelihood to eat fast food (64%) and to eat take-away food (52%). Those who attributed obesity to failure in recognising overweight as a health problem were less likely to eat out at lunch. Those who attributed obesity to genetics *(Most people are overweight because they are simply born that way)* were twice as likely to eat fast food and take-away food, and 76% more likely to eat out at dinner respect to those who disagreed. Subjects who thought that lack of time to prepare healthy meals is an obesity cause were 95% more used to eat fast food, while those attributing obesity to lack of self-control were 85% more used to eat take-away food.

Higher agreement with the thought that Governments play a too protective role was associated with increased likelihood to consume fast food. Those supporting restrictive measures, such as banning the advertising for unhealthy food, were less likely to have lunch outside the home and to consume convenience food than non-supporters. Support to governmental information campaigns about the risks of unhealthy eating was associated with increased likelihood to eat take-away food. Supporters of public funding to companies providing healthy eating education programs for employees, were 91% more likely to have lunch out of home respect to nonsupporters.

Supporters of Government-industry cooperation to improve the nutritional content of processed food were 4.16 times as likely to eat fast food as those who disagreed. Agreement with compulsory labelling for all foods and with governmental subsidisation to reduce fruit and vegetables prices was associated with reduced likelihood to consume fast food.

TABLE 4

ODDS RATIOS (OR) AND 95% CONFIDENCE INTERVALS (CI) FROM LOGISTIC REGRESSION ANALYSIS SHOWING THE ASSOCIATION BETWEEN EATING OUT FREQUENCY AND DIFFERENT PREDICTOR VARIABLES[a]

	MODEL FOR EATING OUT AT LUNCH OR (95%CI)	MODEL FOR EATING OUT AT DINNER OR (95%CI)	MODEL FOR EATING OUT AT FAST FOOD OR (95%CI)	MODEL FOR EATING PRE-PACKAGED MEALS OR (95%CI)
GENDER				
FEMALES VS ≥ MALES	0.69* (0.57-0.85)	-	-	0.59* (0.45-0.77)
AGE CLASS				
16-24 VS ≥ 65	6.32* (3.85-10.37)	2.68* (1.42-5.08)	12.05* (3.29-44.08)	3.53* (1.86-6.71)
25-44 VS ≥ 65	4.43* (2.86-6.85)	2.88* (1.64-5.06)	7.08* (2.00-25.00)	3.10* (1.74-5.50)
45-64 VS ≥ 65	3.10* (2.01-4.71)	1.48 (0.84-2.59)	1.96 (0.54-7.10)	1.74 (0.99-3.08)
COUNTRY OF ORIGIN				
IT VS UK	1.52* (1.13-2.05)	3.14* (2.19-4.51)	1.54 (0.91-2.62)	0.40* (0.27-0.60)
BE VS UK	1.00 (.073-1.38)	0.95 (0.62-1.45)	0.39* (0.19-0.80)	0.64* (0.43-0.94)
PL VS UK	0.88 (0.64-1.19)	0.77 (0.50-1.17)	1.04 (0.59-1.83)	0.59* (0.40-0.86)
DK VS UK	1.06 (0.77-1.48)	0.47* (0.28-0.77)	0.33* (0.14-0.77)	0.44* (0.29-0.67)
MARITAL STATUS				
SINGLE/OTHER STATUS VS MARRIED	1.47* (1.19-1.80)	1.64* (1.26-2.14)	-	1.68* (1.28-2.20)
EDUCATION				
LOW VS HIGH	0.41* (0.30-0.58)	-	-	-
MEDIUM VS HIGH	0.71* (0.58-0.88)	-	-	-
BMI				
NORMAL WEIGHT/UNDERWEIGHT VS OBESE	-	2.04* (1.32-3.15)	2.48*(1.20-5.11)	1.86* (1.23-2.81)
OVERWEIGHT VS OBESE	-	2.05* (1.31-3.20)	2.10 (0.99-4.48)	1.68* (1.11-2.53)
SUBJECTIVE HEALTH STATUS				
GOOD VS BAD	1.80* (1.20-2.69)	-	-	1.23 (0.71-2.15)
FAIR VS BAD	1.62* (1.07-2.47)	-	-	1.85* (1.05-3.25)
A4. MOST PEOPLE LACK THE WILLPOWER TO DIET OR EXERCISE REGULARLY				
AGREE VS DISAGREE	-	-	0.36* (0.17-0.77)	0.48* (0.28-0.83)
NEUTRAL VS DISAGREE	-	-	0.66 (0.28-1.57)	0.57 (0.30-1.05
A5. MOST OVERWEIGHT PEOPLE DON'T VIEW THEIR WEIGHT AS A PROBLEM				
AGREE VS DISAGREE	0.73* (0.56-0.94)	-	-	-
NEUTRAL VS DISAGREE	1.01 (0.76-1.34)	-	-	-
A6. MOST PEOPLE ARE OVERWEIGHT BECAUSE THEY ARE SIMPLY BORN THAT WAY				
AGREE VS DISAGREE	-	1.76* (1.19-2.58)	2.23* (1.34-3.73)	2.04* (1.42-2.94)
NEUTRAL VS DISAGREE	-	0.84 (0.64-1.20)	1.08 (0.66-1.76)	1.04 (0.76-1.43)

[a] Variables are mutually adjusted

*p-value < 0.05

DISCUSSION

The multivariate analysis provided evidence of a significant association between out-of-home lunch consumption and gender, age, country of origin, marital status and education. Other studies observed interactions between those sociodemographic factors, in particular gender, and out-of-home eating, even though these findings are far from conclusive [14,27]. Young and adults were much more likely to eat out on a regular basis, and to eat take away food than the elderly. Other studies reported that old age significantly affects the frequency of eating out [28].

TABLE 4 (CONTINUED)

ODDS RATIOS (OR) AND 95% CONFIDENCE INTERVALS (CI) FROM LOGISTIC REGRESSION ANALYSIS SHOWING THE ASSOCIATION BETWEEN EATING OUT FREQUENCY AND DIFFERENT PREDICTOR VARIABLES[a]

	MODEL FOR EATING OUT AT LUNCH OR (95%CI)	MODEL FOR EATING OUT AT DINNER OR (95%CI)	MODEL FOR EATING OUT AT FAST FOOD OR (95%CI)	MODEL FOR EATING PRE-PACKAGED MEALS OR (95%CI)
A9. MOST PEOPLE ARE OVERWEIGHT BECAUSE THEY DON'T HAVE TIME TO PREPARE HEALTHY MEALS				
AGREE VS DISAGREE	-	-	1.95* (1.16-3.28)	-
NEUTRAL VS DISAGREE	-	-	1.48 (0.82-2.65)	-
A12. MOST PEOPLE ARE OVERWEIGHT BECAUSE THEY VALUE MORE IMMEDIATE SATISFACTION COMPARED TO FUTURE HEALTH RISKS				
AGREE VS DISAGREE	-	-	-	1.85* (1.05-3.26)
NEUTRAL VS DISAGREE	-	-	-	1.28 (0.69-2.39)
B1. OUR GOVERNMENT'S POLICIES TAKE TOO MUCH CARE OF PEOPLE AND DEPRIVE THEM TOO MUCH OF INDIVIDUAL RESPONSIBILITY				
AGREE VS DISAGREE	-	--	1.73* (1.08-2.75)	-
NEUTRAL VS DISAGREE	-	-	0.95 (0.57-1.57)	-
C2. THE GOVERNMENT SHOULD BAN ADVERTISING FOR JUNK FOOD AND FAST FOOD THAT IS AIMED AT ADULTS				
AGREE VS DISAGREE	0.72* (0.55-0.94)	0.77 (0.56-1.07)	-	0.56* (0.39-0.81)
NEUTRAL VS DISAGREE	0.92 (0.70-1.21)	0.62* (.044-0.89)	-	0.80 (0.56-1.15)
C3. THE GOVERNMENT SHOULD SPEND MONEY FOR INFORMATION CAMPAIGNS INFORMING PEOPLE ABOUT THE RISKS OF UNHEALTHY EATING				
AGREE VS DISAGREE	-	-	-	1.75* (1.04-2.93)
NEUTRAL VS DISAGREE	-	-	-	2.04* (1.19-3.49)
C5. THE GOVERNMENT SHOULD SUBSIDISE FIRMS WHICH PROVIDE PROGRAMMES TO TRAIN THEIR EMPLOYEES IN HEALTHY EATING				
AGREE VS DISAGREE	1.91* (1.43-2.57)	-	-	-
NEUTRAL VS DISAGREE	1.37 (1.00-1.87)	-	-	-
C6. ALL FOODS SHOULD BE REQUIRED TO CARRY LABELS WITH CALORIE AND NUTRIENT INFORMATION				
AGREE VS DISAGREE	-	-	0.36* (0.18-0.75)	-
NEUTRAL VS DISAGREE	-	-	0.41* (0.17-0.97)	-
C11. THE GOVERNMENT SHOULD SUBSIDISE FRUIT AND VEGETABLES TO PROMOTE HEALTHIER EATING				
AGREE VS DISAGREE	-	-	0.26* (0.13-0.51)	-
NEUTRAL VS DISAGREE	-	-	0.75 (0.37-1.55)	-
C16. THE GOVERNMENT SHOULD WORK WITH THE FOOD COMPANIES TO IMPROVE THE NUTRITIONAL CONTENT OF PROCESSED FOODS (E.G. LESS SALT OR FATS)				
AGREE VS DISAGREE	-	-	4.16* (1.70-10.18)	-
NEUTRAL VS DISAGREE	-	-	2.68* (1.05-6.84)	-

*p-value < 0.05

There was a significant association between out-of-home eating and the nationality of participants. UK was chosen as the reference country for the analyses because in 2011 it reported the highest household expenditure for catering services (8.4%) (as percentage of total expenditure) [2] among the five European countries, followed by Italy (7.6%), Belgium (5.6%), Denmark (4.7%) and Poland (2.0%), and ranked almost at the top of the EU-27 countries, surpassed by Austria, Portugal, Ireland, Greece (in the range 9.0-11.6%) and Spain (15.2%).

Italians were more likely to eat out both at lunch and at dinner than people from UK, and this may be in contrast with official expenditure data for catering services. The different interpretations of what is considered "eating out" and what is not, given by the respondents from different countries, could lie behind our results. In fact, a limitation of the present study is the lack of a strict definition for *eating out*, simply referring to it as *anywhere lunch*

and dinner were consumed away from home. The definition adopted within the European Commission project HECTOR *Eating out: Habits, Determinants, and Recommendations for Consumers and the European Catering Sector* [4], included all foods that were not prepared at home, so eating out was defined as meals/snacks eaten outside home prepared by food services (catering services, formal and informal) and meals/snacks prepared by food services and consumed at home. When asked how many times they eat out, people would likely include visits at restaurants, cafeterias or canteens, but probably would not include take-away food bought from catering outlets and eaten at the workplace, or packed lunch prepared at home and eaten at school or office. The nature of the food eaten outside the home can also affect the idea of eating out in people's minds, so that people may relate eating out with meals rather than with snacks (salad, sandwich, tea, coffee, etc). Unlike dinner, lunch is a special case, since it has to be eaten out of home for practical reasons of work or study, and may not be necessarily consumed at eating out outlets.

Local culture, traditions, and economics are behind the country differences in eating out and also behind perceptions of what eating out includes. Unfortunately, to our knowledge, there is scarce scientific literature which explores the influence of historical, cultural and sociodemographic factors on the frequency of eating out. To support our analysis on differences by country, we found several analyses from market research studies, shared through the professional channels.

A recent market research [29] reported that in 2011 34% of UK adults consumed lunch out of the home at least once a week, and 23% consumed dinner out of the home once a week or more.

According to our results, these percentages were lower, 27% and 12 % respectively. A previous research reported that in UK most eating out occasions took place in restaurants or other eatingout outlets, nevertheless take-away food accounted for a fourth of eating out visits and it may consist of a whole meal that is often eaten at home rather than *on the go* [4]. The present work confirmed the importance of take-away food in UK, reporting the highest percentage of people eating take-away food once or more per week.

According to a recent market research [30], eating out at lunch in Italy has been increasing in the last decades, with lunch being less and less considered the main meal of the day. Italians' out-of-home lunch was consumed at canteens (36.6%) and restaurants (13.3%), but also at bars/snack-bars (11.6%) and at the place of work (35%), in this last case food was likely brought from home. Lunch mainly consisted of a sandwich (25.7%) or pizza (23.5%), but also of a first dish (14,7%), a big mixed salad (13,2%) or a main course (11.8%), and only in 11.0% of cases of a whole meal [30]. The study also reported that 28.3% of people aged ≥18 years ate out at dinner once or more per week, a result very close to ours (29.7%, people aged ≥16 years). At dinner, socializing and pleasure visits prevailed on functional visits, and less expensive restaurants cooking pizza were preferred in these occasions [30]. Another recent national study [31] observed that the choice of eating out in Italy was due, in addition to the work requirements and conviviality ones, to the opportunities of disobey the precepts of a healthy nutrition, and the attention to the nutritional content of what you eat when you dine at a restaurant was lower than when you eat at home.

The Danish official website [32] reported that Denmark is one of the most expensive countries in Europe for food and drinks, and eating out is known to be expensive. In 2011 Denmark experienced one of the lowest households expenditures for catering services [2], this being confirmed by the lowest rate of people eating out at dinner here reported, and it is reasonable to think that, in spite of the high percentage of people who declared to eat out at lunch, a considerable number of them ate a packed lunch brought from home [32]. The same can be assumed about our outcomes from Poland. In Poland, people were not used to eat outside the home under the socialist system, until 1991 when the new democratic government took power. After 1991, numerous foreign restaurant chains were established, which are prevalently frequented by young and wealthy people, while traditional Polish restaurants are preferred by older people, usually on special occasions [33].

Behavioural and environmental factors were not explicitly recognized as obesity causes by regular consumers of fast food and ready-prepared food. In fact, convenience food

consumption was positively associated with obesity attribution to genetics, and inversely associated with obesity attribution to lack of willpower, contrary to the prevailing opinion which mainly ascribed obesity to causes related to individual willpower and behaviour and to the food supply environment [23]. Since several studies reported that causal attributions of obesity affect the support for public policies [21,24,25], and in particular, people who ascribed obesity to the food supply environment were supportive of market regulation policies [23], the present study confirmed the importance of promoting public communication on the role of individual behaviour and excessive availability of uhealthy food.

However, the importance of the food supply environment was indirectly recognized by regular consumers of convenience food. Attributing obesity to lack of time to prepare healthy meals, and attributing obesity to lack of self-control *(Most people are overweight because they value more immediate satisfaction compared to future health risks)* were associated with increased likelihood to consume fast food and ready-prepared food respectively. Moreover, fast food consumers expressed higher support to governmental preventive action aimed at ensuring a healthy food environment. People presumably chose to consume ready-prepared food for lack of time to cook at home, however they also seemed aware that food prepared out of home does not meet health and nutrition requirements, confirming general negative attitudes towards ready meals observed in other studies [34], although some others found that overweight people had more positive beliefs about the nutritional value of ready meals [35]. The work of Jabs and Devine [1] documented the implication of time scarcity in changes in food consumption patterns, such as a decrease in home food preparation and family meals, and an increase in the consumption of ready-prepared foods. Time scarcity has implications for understanding the dramatic increase in overweight and obesity in adults and children [36,37] and is recognised as an important barrier for cooking and healthy eating [38,39]. The present study confirms the need for strategies that ensure the availability and affordability of healthy out-of-home eating, in order to meet convenience and time saving needs of busy modern lives. The lack of policies involving small food outlets or fast-food restaurants has been evidenced in countries of the WHO European region, where the focus is essentially on public catering [17].

Fast food consumers expressed lower support for price subsidy for healthy food and higher agreement with the thought that Governments play an excessively protective role, and deprive people of individual responsibility. To reconcile the Governments' protective role with the concept of personal responsibility, interventions should be planned in order to enhance informed choice, and support individual responsibility [40].

CONCLUSION

Out-of-home eating people substantially support information-based prevention, and actions aimed at ensuring healthier out-of home eating. Lower support was evidenced for restrictions and regulations of the food supply environment.

Governments have a wide range of actions at their command to tackle obesity. This work gives some indications for identifying barriers and opportunities for policy interventions aimed at supporting healthy choices of people who eat out frequently. Future research on the comprehension of factors influencing out-of-home food choices, and the support of out-of-home food consumers towards public interventions for the catering sector, could have important implications for effective strategies to promote healthy eating in this segment of population.

ACKNOWLEDGEMENTS

FUNDING: *The research leading to these results received funding from the European Union Seventh Framework Programme (FP7/2007-2013) under Grant Agreement no. 226713, Eatwell Project.*

COMPETING INTERESTS: *None declared*

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