Published article citation:
Guiné RPF, Ferrão AC, Ferreira M, Correia P, Cardoso AP, Duarte J, Rumbak I, Shehata A-M, Vittadini E, Papageorgiou M. (2019) The motivations that define eating patterns in some Mediterranean countries. Nutrition and Food Science, 49(6), 1126-1141.

THE MOTIVATIONS THAT DEFINE EATING PATTERNS IN SOME MEDITERRANEAN COUNTRIES

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Abstract

Purpose: This study is part of the international project EATMOT, designed to investigate several issues related to food choice and consumption patterns in different countries, including health related factors; economic and availability aspects; emotional determinants; social, cultural and religious influences; marketing and advertising campaigns and finally environmental concerns.

Methodology: The present study was based on a questionnaire that was exclusively prepared for the project, and which was applied to collect data in different countries, in particular Croatia, Egypt, Italy, Greece and Portugal, which are typically associated with the Mediterranean diet.

Findings: The results obtained allowed, in general, to conclude that in all 5 countries the motivations related to health as well as environment & politics were the more relevant to determine people's eating habits (scores varying from 0.3 to 0.7). Women were more influenced by eating motivations than men, and people with moderate exercise were more susceptible to health and environmental motivations and less to emotional, social or marketing motivations ($p < 0.001$ in all cases). It was also observed that people who adopted a special diet were more prone to eating motivations and that the emotional motivations were more pronounced in people with eating disorders ($p < 0.001$). Finally, people without chronic diseases or allergies were even more influenced by health motivations than those who actually suffered from these health problems ($p < 0.001$ in both cases).

Originality/Value: This work is important due to the multinational coverage, thus allowing to evaluate the most relevant factors that influenced the food choices of the populations around the Mediterranean Sea, sharing the common link to the Mediterranean

Diet. The study allowed concluding that, in general, the food choices were primarily determined by health factors, and also by concerns related to the environment and sustainability as well as by political influences.

Keywords: psychology of eating, questionnaire survey, healthy diet, traditional food

1. INTRODUCTION

The Mediterranean Diet (MD) is a dietary pattern usually followed by the people of some countries situated near to the Mediterranean Sea (Boccardi et al., 2018) and is characterized by a high consumption of vegetables, fruits, whole grains, legumes, nuts, and seeds; by an abundant consumption of olive oil, the privileged source of dietary fat; by a moderate to low consumption of animal products; and by a regular but moderate consumption of red wine at mealtimes (Ostan et al., 2015; Thodis et al., 2018; Trichopoulou et al., 2003). This dietary pattern is also associated with the importance of people eating with company, among family and friends (Boccardi et al., 2018). Moreover, the Mediterranean dietary patterns may vary according to age, gender, ethnicity, culture and other lifestyle factors (Barrea et al., 2018; Park et al., 2005). Scientific evidence has shown that the adherence to the MD is associated with several health benefits, such as, for example, a lower incidence of cancer, cognitive diseases and cardiovascular diseases (CVD) (Grosso et al., 2014; Renzella et al., 2018; Schwingshackl and Hoffmann, 2015; Singh, 2016). However, despite the benefits of this dietary pattern, some people are changing the traditional MD by introducing unhealthier foods, such as low nutrient dense foods (Castro-Quezada et al., 2014). In fact, choosing to adopt a specific dietary regimen involves different factors interrelated with each other (Köster, 2009; Organ et al., 2015).

A healthy diet helps to protect against malnutrition in all forms, as well as noncommunicable diseases (NCDs), such as diabetes, heart disease, stroke and cancer (World Health Organization, 2018a). Nowadays, people are more aware about the association between the quality of the diet and their personal health (van Buul et al., 2017). However, despite this knowledge, even health-conscious consumers often make unhealthy food choices, because the knowledge about a healthy eating not always translates into a dietary change or into better eating habits (Mai and Hoffmann, 2014). During a day, individuals are confronted with several food choices, which are driven by reasons that they are not fully aware. Food choice is a complex system influenced by multiple factors related to the product (such as sensory properties), and also to the consumer (like for example restrictions or preferences) as well as the consumption context (culture, religion, health, convenience and price, biology, emotions, marketing, political and also environmental concerns) (Kaya, 2016; Pelly et al., 2018; Stasi et al., 2018). Among the different motivations that influence food choices, culture is one of the most important and explains the differences in food preferences across countries and cultures (Rozin, 2007; Siegrist et al., 2015). In fact, food consumption is closely related to the social context, since food, through its symbolic value, can help to successfully reveal people's identities and demonstrate who they are and where they belong within society (Barauskaite et al., 2018; Landström et al., 2009). Hence, given the urgency to improve people's eating habits (Leng et al., 2017), it is crucial to understand their food motivations, so that the policy recommendations can be more effective.

The project EATMOT with title "Psycho-social motivations associated with food choices and eating practices" aims to study the different psychological and social motivations that determine people's eating patterns in relation to their choices or eating habits and the range of the study is multinational. In the frame of the project it was

developed a questionnaire that compiled different perspectives provided by existing research about the motivations on eating behaviour, but also extended them by including other motives identified by the project team members.

This particular study intended to characterize the motivations that could define eating patterns in the Mediterranean region, more specifically in 5 Mediterranean countries (Croatia, Egypt, Italy, Greece or Portugal), which are typically associated with the Mediterranean diet, and that define a region with characteristic food habits. The factors investigated include aspects related to health, emotions, budget, availability, society, culture, environment, politics, marketing and commerce. These allowed to characterize the food choice determinants of the populations of the targeted region: countries distributed around the Mediterranean Sea under the influence of the Mediterranean Diet, recognized by UNESCO as a cultural heritage of humanity.

2. DESCRIPTION OF OBSERVATIONAL STUDY

2.1. Questionnaire used for assessment of eating motivations

For the EATMOT project a questionnaire was developed to investigate the psycho-social motivations that influence food choices and eating habits. The questionnaire was first prepared in English and then translated into the native languages of the participating countries, following a double sided translation-checking methodology. The questionnaire was structured in ten different parts: Part I – Sociodemographical data; Part II – Anthropometric data and behavioural and health related elements; Part III – Attitudes relating to healthy food; Part IV – Sources of information about a healthy diet; Part V – Healthy motivations; Part VI – Emotional motivations; Part VII – Economic and availability motivations; Part VIII – Social and cultural motivations; Part IX – Environmental and political motivations; Part X – Marketing and commercial

126 motivations. These types of motivations were chosen because many different studies
127 somehow have indicated that eating habits and/or food choices are dependable on factors
128 such as the ones investigated through this questionnaire. The questionnaire was developed
129 and firstly validated on a sample of Portuguese people (Ferrão et al., 2018, 2019) and was
130 than extended into other countries as described in this work, after proper translation.
131 In order to measure the participants' opinions about the statements that were related
132 to the different types of motivations, they were asked to state their agreement measured
133 on a 5-point Likert scale varying from 1 (totally disagree) to 5 (totally agree) (Likert,
134 1932). Globally, 55 statements related to eating habits and the choice of a certain food
135 were compiled according to different motivations, as indicated: Healthy motivations – 11
136 items; Emotional motivations – 10 items; Economic and availability motivations – 8
137 items; Social and cultural motivations – 11 items; Environmental and political
138 motivations – 8 items; Marketing and commercial motivations – 7 items.
139
140 **2.2. Data collection**
141 For the present study about the motivations in countries of the Mediterranean area, a
142 descriptive cross-sectional study was performed on a non-probabilistic sample with 4708
143 participants living in Portugal (28%), Greece (11%), Egypt (17%), Croatia (33%) and
144 Italy (11%). The questionnaire was approved by the Ethical Committee (Reference nº
145 04/2017) before being applied. The data collection occurred between September 2017
146 and June 2018, and was addressed only to adults (aged 18 or over), after informed consent
147 was obtained and guaranteeing the confidentiality of the individual answers registered,
148 thus complying with all ethical issues necessary.
149
150 **2.3. Statistical analysis**

The exploratory analysis of the data was made by basic statistical tools. For each of the six types of eating motivations considered, an average value was calculated from the scores obtained in all the items included in that motivation category. The scores of the original scale were recalculated so as to eliminate the effect of the middle point, which became zero instead of 3. Hence the scale for motivations varied from -2 to +2, in which the negative values meant "no influence" and the positive ones meant "influence".

So as to verify whether the mean values were statistically different between groups a statistical analysis was applied. For comparisons between two groups the t-test for independent samples was used, while for comparisons between three groups, was used the Post-Hoc Tukey HSD (Honestly Significant Difference) coupled to an analysis of variance (ANOVA). The use of parametric tests was possible because the conditions were verified, namely the normality of the distribution and equality of variances according to Levene's test. The analysis of the data was made by using SPSS software from IBM Inc., Version 25 (Armonk, New York, USA) and in all tests the level of significance considered was 5%.

3. RESULTS

3.1. Sample characterization

The sample was composed of 4708 participants, aged between 18 and 90 years old, being on average 34.81 ± 14.66 years, from which 68.1% were female and 31.9% were male. As it can be observed in Table 1, the participants were classified into age categories according to: young adults ($18 \leq age \leq 30$), corresponding to 49.3%; average adults ($31 \leq age \leq 50$), accounting for 32.7%; senior adults ($51 \leq age \leq 64$), representing 15.4%; and finally elderly (≥ 65), which accounted for 2.6% of the sample.

Table 1. Sociodemographic characterization.

Sociodemographic Data		**Percentage (%)**
Age	Young adults: 18 ≤ age ≤ 30	49.3
	Average adults: 31 ≤ age ≤ 50	32.7
	Senior adults: 51 ≤ age ≤ 64	15.4
	Elderly: Age ≥ 65	2.6
Gender	Female	68.1
	Male	31.9
Highest Level of Education	Primary School	2
	Secondary School	38.5
	University Degree	59.5
Living Environment	Rural	21.2
	Urban	66.9
	Sub-urban	11.9
Civil State	Single	48.2
	Married/Living Together	45.4
	Divorced/Separated	3.9
	Widow	2.5
Job Situation	Student	53.5
	Employed	6.1
	Unemployed	31.4
	Retired	4.2
	Working student	4.8
Professional Area	Nutrition	3.9
	Food	9.1
	Agriculture	3.8
	Sport	9
	Psychology	2.7
	Health	20.5
	Others	51.0

Most of the participants (59.5%), had a university degree and only 2.0% of them had the primary school as the highest level of education achieved. As for the civil state, 48.2% of the participants were single, 45.4% were married or lived together as a marital couple, 3.9% were divorced or separated and 2.5% were widowed. Regarding the living

environment, the majority of the participants (66.9%) lived in an urban environment, followed by the participants who lived in rural areas, 21.2%, and finally the ones who lived in sub-urban surroundings, 11.9% (Table 1).

Concerning the job situation, most of the participants were students (53.5%), 31.8% were unemployed, 6.1% were employed, 4.8% were working students and 4.2% were retired (Table 1). As for the participants' professional activity or field of studies, the majority of the participants, 51%, did not have a professional activity or field of studies related to any of the options suggested in the questionnaire (nutrition, food science, agriculture, sport, psychology, activities related to other health areas), 20.5% had a professional activity or field of studies related to other health areas, 9.1% had a professional activity or field of studies related to food, 9% had a profession or studies related to sports, 3.9% had a professional activity or field of studies related to nutrition, 3.8% had a professional activity or field of studies related to agriculture and 2.7% had an activity or studies in the psychology area.

Regarding the anthropometric data for the sample at study, the height was for the whole sample on average 1.7 ± 0.1 meters (1.65 ± 0.07 m for women and 1.79 ± 0.08 m for men), and the weight was on average 68.64 ± 14.34 kg (63.60 ± 11.49 kg for women and 79.22 ± 13.87 kg for men). The Body Mass Index (BMI) was calculated as weight (kg) divided by the square of height (m^2) and then classified according to the standards of the International Classification: underweight (BMI < 18.5 kg/m^2), normal weight (18.5 ≤ BMI ≤ 24.99 kg/m^2), overweight (25 ≤ BMI ≤ 29.99 kg/m^2) and obese (BMI ≥ 30.00 kg/m^2) (World health Organization, 2006). The results showed that the BMI for the whole sample was on average equal to 23.71 ± 4.07 kg/m^2, which means that in general the participants had a normal weight. When analysed by gender, it was observed that the

206 average values for women were lower (23.28 ± 4.12 kg/m^2) than those for men (24.64 ±
207 3.81 kg/m^2).

208 Table 2 presents the BMI class according to country and it shows that, regardless of
209 the country, most of the participants had a normal weight. The results further showed that
210 Egypt had a considerable higher percentage of participants with overweight and obesity,
211 when compared to the other countries. Moreover, Portugal was the country with the
212 lowest percentage of participants classified as overweight or obese.

213

214 Table 2. Frequencies according to BMI Class.

BMI[1] Class	**Portugal (%)**	**Italy (%)**	**Croatia (%)**	**Greece (%)**	**Egypt (%)**
Underweight (BMI < 18.5)	5.5	5.9	3.4	2.8	1.5
Normal Weight (18.5 ≤ BMI ≤ 24.9)	79.3	63.2	59.9	68.3	49.3
Overweight (25 ≤ BMI ≤ 29.9)	11.3	24.0	30.1	23.5	33.7
Obesity (BMI ≥ 30)	3.2	6.8	6.6	5.4	15.4

215 [1]BMI = Body Mass Index

216

217 Table 3 presents some of the behavioural aspects that characterize the sample at
218 study. According to the World Health Organization (WHO) (2018b), an inadequate level
219 of physical activity is one of the leading risk factors for death worldwide. In this study,
220 31.9% of the participants answered that they practiced physical exercise moderately and
221 only 9.8% of them practiced physical exercise intensively. On the other hand, a
222 reasonable percentage of the participants, 16.5%, answered that they never practiced
223 physical activity, which is preoccupying attending to the importance of physical activity
224 to promote health at various levels.

225 As for the number of hours per day that the participants spent watching TV or at the
226 computer, it was observed that 30.9% spent between 0 to 2 hours on TV/computer per

day, which is considered low, while 19.6% of the participants indicated that they spend more than 8 hours per day watching TV or at the computer, and in this case it is considered a very high utilisation of these screen technologies (Table 3). Nevertheless, these results must be interpreted with care, because no distinction was made in que questionnaire as to the use of screens for leisure purposes and for work, in which case it cannot be avoided.

A balanced diet is fundamental for the maintenance of health (Schwingshackl et al., 2018). Therefore, the participants were asked about how often they believed they practiced a balanced diet, and as it can be observed in Table 5, 37.8% considered that they do it frequently, 36.6% sometimes, 12% rarely, 7.8% never while 5.8% of the participants considered that they always practice a balanced diet. This questions intended to make a self-evaluation of their own eating patterns, but it was based on each one's individual perception of what they consider to be a healthy diet. Therefore, the results must be read as defining an approximation to a heathy diet.

The results in Table 3 further showed that most of the participants, 77.4%, did not follow any specific food regimen. It is interesting to highlight that more women, 8.6%, followed a dietary regimen based on a caloric restriction, when compared to men, 6%. These results are not surprising, since women are more likely to be dissatisfied with their body image than men and therefore they have a greater tendency to adopt dietary regimens that stimulate weight loss (Germov and Williams, 2017).

Table 3. Behavioural aspects.

Behavioural aspects		**Percentage (%)**
Physical Exercise	Never	16.5
	Sporadically (< 1 time/week)	22.1
	Occasionally (1 time/week)	19.7
	Moderately (2-3 times/week)	31.9
	Intensively (> 3 times/week)	9.8
Hours of TV/Computer/day	Low: [0 – 2] h	30.9
	Medium:]2 – 4] h	25.5
	High:]4 – 8] h	24
	Very high: > 8 h	19.6
Frequency of balanced diet	Never	7.8
	Rarely	12
	Sometimes	36.6
	Frequently	37.8
	Always	5.8
Dietary regimen	Raw Foodism	1.7
	Frutarianism	0.9
	Vegetarianism	2.4
	Veganism	1
	Flexitarianism	5.8
	Caloric restriction	7.8
	Religious restriction	1
	Other	2.1
	No specific diet	77.4

Table 4 presents some health conditions that characterize the sample at study. The results indicate that the majority of the participants, 74.5%, did not have any chronic disease. The fact that most of the participants were aged under 50 years old certainly is one of the factors explaining this result, allied to a possible adherence to the Mediterranean Diet, whose benefits to prevent and fight chronic diseases are documented (Dohrmann et al., 2018; Ndlovu et al., 2018; Serra-Majem et al., 2019). As for the

participants' food allergies or intolerances, it was observed that the majority (86.9%) did not suffer from any food allergy or intolerance.

Table 4. Health aspects.

Health aspects		**Percentage (%)**	
		YES	**NO**
Chronic Diseases	Cardiovascular diseases	3	97
	Diabetes	1.7	98.3
	High cholesterol	6.7	93.3
	Arterial hypertension	8.5	91.5
	Gastric disorders	4.4	95.6
	Intestinal disorders	2.1	97.9
	Obesity	2.5	97.5
	Other	4.9	95.1
	No chronic diseases	74.5	25.5
Food Allergy/Intolerance	Lactose	4.6	95.4
	Casein	0.8	99.2
	Gluten	1.4	98.6
	Nuts	1.1	98.9
	Shellfish	3.9	96.1
	Other	2.6	97.4
	No allergies or intolerances	86.9	13.1
Eating disorders	Bulimia nervosa	1	99
	Anorexia nervosa	5.5	94.5
	Binge-eating	4.4	95.6
	Other	0.5	99.5
	No eating disorders	88.6	11.4

From the sample at study, 88.6% of the participants answered that they never had an episode of any eating disorder (Table 4). As for those who had experienced one, the most frequent was anorexia nervosa, at least once by 5.5% of the participants. When seen by gender, it was observed that a higher percentage of women already suffered from at least one eating disorder (bulimia nervosa: 1.4%; anorexia nervosa: 6.4%; binge-eating: 4.8%;

other: 0.6%) when compared to men (bulimia nervosa: 0.3%; anorexia nervosa: 3.5%; binge-eating: 3.4%; other: 0.2%). In fact, eating disorders are reported to be more common among women than men (Murray et al., 2017).

One other important factor related to food choice is depending whether people are responsible for buying their own food. In this study, 83.3% of the participants bought their own food while only 16.79% did not, being this percentage higher for women (87%) than for men (75.6%).

3.2. Eating motivations

Table 5 presents the participants' eating motivations by country and, in general regardless of the country, the participants' food choices were not heavily influenced by any of the considered types of motivations. For Portugal and Italy, the participants' food choices were more influenced by environmental and political motivations, while in Croatia and Egypt the most important motivation was health, and in Greece the participants' were more influenced by health, as well as environmental and political motivations. The results of the ANOVA test showed that those differences between countries were statistically significant (Health: $F = 113.577$, $p < 0.001$; Emotional: $F = 82.377$, $p < 0.001$; Economic and availability: $F = 66.832$, $p < 0.001$; Social and cultural: $F = 174.475$, $p < 0.001$; Environmental and political: $F = 193.268$, $p < 0.001$; Marketing and commercial: $F = 238.103$, $p < 0.001$). These results are not surprising since health is an important determinant for people's food choices (Birkenhead and Slater, 2015). Additionally to health motivations, consumers' are more conscientious about the impact of their diets on the environment and also about the importance of adopting diets that are more sustainable from an environmental point of view (Hoek et al., 2017). In a study by Markovina et al. (Markovina et al., 2015) it was found that the most important food choice

motivation in Portugal and Greece was the price, which does not agree with the finding in this work. However, it is worth mention that the cited study was dated from 2015 and, due to greater alert to the consequences of climate change and pollution effects, the environmental factors may be overcoming those of commodity or even price, because people attribute value to intangible values linked to the preservation of the natural biosystems. Furthermore, the differences between countries could be partially explained by the variations in the climate, geography, socioeconomic factors, culture and history of the countries involved in the study (Hoffman and Gerber, 2013).

Table 5. Motivations by country and physical exercise.

Type of motivations	**Country[1]**				
	Portugal	**Italy**	**Croatia**	**Greece**	**Egypt**
Health	0.7±0.5^{c}	0.4±0.5^{a}	0.4±0.6^{a}	0.3±0.6^{a}	0.5±0.5^{b}
Emotional	-0.3±0.5^{a}	0.0±0.7^{b}	-0.2±0.7^{a}	0.0±0.7^{b}	-0.3±0.7^{c}
Economic and availability	0.0±0.4^{b}	-0.1±0.5^{a}	0.1±0.5^{c}	-0.1±0.5^{a}	0.2±0.6^{d}
Social and cultural	-0.1±0.4^{b}	-0.1±0.4^{b}	-0.1±0.5^{b}	-0.3±0.5^{a}	0.3±0.5^{c}
Environmental and political	0.8±0.5^{e}	0.6±0.6^{d}	0.1±0.7^{a}	0.3±0.7^{b}	0.4±0.6^{c}
Marketing and commercial	-0.6±0.6^{a}	-0.5±0.5^{b}	-0.2±0.5^{d}	-0.4±0.6^{c}	0.1±0.5^{e}

Type of motivations	**Physical activity[1]**				
	Never	**Sporadic < 1/week**	**Occasional 1/week**	**Moderate 2-3/week**	**Intense >3/week**
Health	0.3±0.6^{a}	0.4±0.5^{a}	0.5±0.5^{b}	0.7±0.5^{d}	0.6±0.6^{c}
Emotional	0.1±0.7^{c}	-0.1±0.7^{bc}	-0.1±0.7^{b}	-0.2±0.6^{a}	-0.2±0.7^{a}
Economic and availability	0.1±0.6^{b}	0.1±0.5^{b}	0.1±0.5^{b}	0.0±0.4^{a}	0.0±0.5^{a}
Social and cultural	0.0±0.6^{b}	-0.1±0.5^{a}	-0.1±0.5^{a}	-0.1±0.5^{a}	-0.1±0.5^{a}
Environmental and political	0.4±0.7^{a}	0.3±0.7^{a}	0.4±0.7^{a}	0.6±0.6^{b}	0.4±0.7^{a}
Marketing and commercial	-0.1±0.6^{d}	-0.3±0.6^{c}	-0.3±0.6^{c}	-0.6±0.6^{a}	-0.4±0.6^{b}

[1]Scale from -2 (no influence) to +2 (very high influence); all values stand for mean ± standard deviation; values in the same line with the same superscript are not statistically different, ANOVA with Tukey HSD post-hoc test (level of significance 5%).

As it can be observed in Table 5, which relates also eating motivations with physical activity, the motivation with a higher average score was health, 0.7±0.5, for the participants who practiced physical activity moderately (2-3 times per week). Moreover, the results also showed that the participants who practiced physical activity moderately seemed to have more environmental and political concerns when choosing their food (0.6±0.6). On the other hand, the participants who practiced physical activity moderately were less influenced by emotional, social & cultural or marketing & commercial motivations. The results of the ANOVA test showed that the differences between groups were statically significant (Health: $F = 98.949$, $p < 0.001$; Emotional: $F = 24.870$, $p < 0.001$; Economic and availability: $F = 16.336$, $p < 0.001$; Social and cultural: $F = 9.339$, $p < 0.001$; Environmental and political: $F = 45.606$, $p < 0.001$; Marketing and commercial: $F = 112.735$, $p < 0.001$). Another interesting result is the fact that the food choices of the participants who practiced physical activity moderately or intensively were less influenced by emotional concerns, when compared to the other groups of physical activity. In the study of Loprinzi and his colleagues (Loprinzi et al., 2014) it was found that the participants who practiced physical activity according to the guidelines provided by the authors of that study were more likely to adopt a healthy diet.

Table 6 shows the participants' eating motivations according to gender and, as it can be observed, for women the most important motivation was health, while men's food choices were mainly influenced by health as well as environmental and political concerns. The results of the T-test showed that those differences between genders were statistically significant for almost every type of motivation, with the exception of social and cultural motivations ($p = 0.21$). Nevertheless, since the average scores were always lower than 1.5, for both men and women, their food choices were not much influenced by none of

the considered types of motivation. These results are in line with previous research, where it was also found that, in general, women are more concerned with their diet, weight and health control (Johansen et al., 2011) and therefore they have a greater tendency to have strong positive motivations towards eating a healthy diet (Naughton et al., 2015).

Table 6. Motivations by Gender and dietary regimen.

Type of motivations	Gender[1]		T-test[2]
	Female	Male	p-value
Health	0.6±0.5	0.4±0.6	< 0.001
Emotional	0.0±0.7	-0.2±0.6	< 0.001
Economic and availability	0.0±0.5	0.0±0.5	0.033
Social and cultural	0.0±0.5	-0.1±0.5	0.21
Environmental and political	0.5±0.6	0.4±0.7	< 0.001
Marketing and commercial	-0.3±0.6	-0.4±0.6	0.001
Type of motivations	**Dietary regimen[1]**		**T-test[2]**
	Special Diet	**No Special diet**	**p-value**
Health	0.6±0.5	0.5±0.6	< 0.001
Emotional	0.0±0.7	-0.1±0.7	< 0.001
Economic and availability	0.1±0.5	0.1±0.5	0.218
Social and cultural	0.0±0.5	-0.1±0.5	0.052
Environmental and political	0.5±0.6	0.4±0.7	< 0.001
Marketing and commercial	-0.3±0.6	-0.4±0.6	0.024

[1]Scale from -2 (no influence) to +2 (very high influence); The values stand for mean ± standard deviation. [2]T-test for independent samples (level of significance 5%).

Since people's dietary regimen is one of the determinants that affects their food choices (Hoefkens et al., 2011), it was also analysed if there were differences in the participants' food choices according to their dietary regimen. Table 6 also presents the participants' motivations for food choices by dietary regimen and, in general, the food choices of the participants who followed a special diet were more influenced by different factors when compared with people with a regular diet. The major motivation for the food

choices of the participants who followed a special diet was health (0.6±0.5), being this significantly higher than for who did not follow any special diet (0.5±0.6). This finding indicates that the participants were aware of the impact of dietary patterns on the development or prevention of diseases, so much that those who followed a special diet did it strongly motivated by health concerns. Many published studies associate special diets with health issues (Braha et al., 2017; Coelho et al., 2019; Guallar-Castillón et al., 2012; Lavallee et al., 2019; Satija and Hu, 2018; Yu et al., 2018). The results of the T-test showed that the differences in the food choice motivations according to the participants' dietary regimen were statistically significant, with the exception of the economic & availability motivations ($p = 0.218$), as well as social & cultural motivations ($p = 0.052$).

As it can be observed in Table 7 the food choices of the participants who had chronic diseases were more influenced by health motivations (0.5±0.5), followed by the environmental and political motivations (0.4±0.7). For the participants who did not have any chronic disease, the major determinants for their food choices were health (0.6±0.6) and also environmental & political concerns (0.6±0.7). Furthermore, the average score for the health motivations among the participants who did not have any chronic disease was higher when compared to those who suffered from chronic diseases, meaning that having a health problem might not be motivating enough to eat healthier. Therefore, it might be due to inappropriate food choices that these diseases arise and progress in these individuals, who are reckless regarding their health. Again there were found significant differences in the food choice motivations of the participants who had chronic diseases and those who had not, with the exception of economic & availability motivations ($p = 0.438$), as well as environmental & political motivations ($p = 0.631$). According to other studies, having a chronic disease is a factor that may change people's eating habits and

prompt them to eat healthier. For example, in the study developed by Ghelfi et al. (Ghelfi et al., 2018), cancer patients and long-term survivors are known to be more sensitive to health-related information and dietary changes.

Table 7. Motivations by chronic diseases, allergies/intolerances and eating disorders.

Type of motivations	Average value for each group[1]		T-test[2]
	Chronic diseases	No chronic diseases	p-value
Health	0.5±0.5	0.6±0.6	< 0.001
Emotional	-0.1±0.7	-0.1±0.7	0.007
Economic and availability	0.1±0.5	0.1±0.5	0.438
Social and cultural	0.0±0.5	0.0±0.5	0.631
Environmental and political	0.4±0.7	0.6±0.7	< 0.001
Marketing and commercial	-0.3±0.6	-0.5±0.6	< 0.001
Type of motivations	**Allergies/intolerances[1]**		**T-test[2]**
	Allergies/ intolerances	No allergies/ intolerances	p-value
Health	0.5±0.5	0.6±0.5	< 0.001
Emotional	-0.1±0.7	-0.1±0.7	0.136
Economic and availability	0.1±0.6	0.1±0.5	0.031
Social and cultural	0.0±0.5	0.0±0.5	0.669
Environmental and political	0.4±0.7	0.6±0.7	< 0.001
Marketing and commercial	-0.4±0.6	-0.4±0.7	< 0.001
Type of motivations	**Eating disorders[1]**		**T-test[2]**
	Eating disorders	No eating disorders	p-value
Health	0.4±0.5	0.5±0.5	< 0.001
Emotional	0.2±0.7	-0.1±0.6	< 0.001
Economic and availability	0.2±0.5	0.0±0.5	< 0.001
Social and cultural	0.1±0.5	-0.1±0.5	< 0.001
Environmental and political	0.4±0.6	0.5±0.7	0.112
Marketing and commercial	-0.1±0.6	-0.4±0.6	< 0.001

[1]Scale from -2 (no influence) to +2 (very high influence); The values stand for mean ± standard deviation. [2]T-test for independent samples (level of significance 5%).

According to Sommer et al. (2012), approximately 35% of the population modify their diet because of adverse reactions to food. In the present study, not surprisingly, there were found significant differences between the food choices of the participants who had food allergies or intolerances and those who had not, regarding the health motivations ($p < 0.001$), economic & availability motivations ($p = 0.031$), environmental & political concerns ($p < 0.001$) and marketing & commercial motivations ($p < 0.001$) (Table 7). The results further showed that the food choices of the participants who had food allergies/intolerances were primarily affected by health motivations (0.5±0.5), while the food choices of those who had not were more affected by health (0.6±0.5), as well as environmental & political determinants (0.6±0.7). However, it is important to refer that the food choices of the participants who did not have allergies or food intolerances were affected by health concerns to a higher extent, when compared to those who suffered from them. This is a surprising result and, up to our knowledge, no previous works were found that could explain this, since people with problems motivated by the ingestion of certain types of food should be more careful as to what they eat and the impact on their well-being.

Table 7 further shows the participants' eating motivations according to their eating disorders and, for those who already suffered from an episode of any eating disorder, the main motivations for their food choices were health (0.4±0.5), as well as environmental & political concerns (0.4±0.6), this trend being similar for the participants who never suffered from any eating disorder (health motivations: 0.5±0.5; environmental and political motivations: 0.5±0.7). With the exception of environmental & political motivations, there were found significant differences in the eating motivations of the participants who already had an episode of an eating disorder and those who never had. Moreover, the participants who already had an eating disorder were more influenced by

emotional motivations (0.2±0.7), when compared to those who never had (-0.1±0.6). These results are in line with previous studies, where it was also found that eating driven by emotional reasons is more common among those who already suffered from an eating disorder (Boggiano et al., 2017).

4. CONCLUSION

In general, regardless the variable analysed, the participants' food choices were more strongly influenced by health and environmental & political motivations. The participants' eating motivations varied across countries and while in Portugal and Italy the participants' food choices were more influenced by environmental & political concerns, in Croatia and Egypt it was health the major determinant and in Greece the participants' food choices were more influenced by health, as well as environmental & political motivations. These results highlighted the importance that the Mediterranean countries attribute to health and the sustainability of their diets. In addition, it was also possible to perceive that those differences in the eating motivations between countries were statistically significant.

Factors such as gender, level of physical activity, dietary regimen, absence of a chronic disease, presence of food allergies or intolerances and the fact that the participants had already experienced an episode of an eating disorder, were proved to influence the participants' food choices. This research has also shown that women tended to be more influenced by eating motivations than men, with significant differences between genders, and that the participants who practiced physical activity moderately were more concerned about the health and sustainability of their diets than with emotional, social, or even marketing issues. There were also observed significant differences between the participants who adopted a special diet and those who did not, so that the food choices of

429 those who followed a specific dietary regimen were more influenced by eating
430 motivations. Moreover, the participants who already suffered from an eating disorder
431 tended to be more influenced by emotional motivations than those who had not, with
432 significant differences between the two groups. The absence of chronic diseases or food
433 intolerances/allergies also showed to have an influence on the participants' food choices,
434 so that those who did not have any chronic disease or food intolerance/allergy were more
435 influenced by health motivations, when compared to the participants who had them.

436 One of the limitations of this study was the low number of countries included in the
437 study as a sample of the Mediterranean Countries, which are far more. Five was the
438 possible number of countries, even though more countries were invited but chose not to
439 participate in the study. One other limitation was the representability in each of the
440 participating countries, which was not equalitarian in terms of the stratified groups of the
441 population. Also, the number of responses obtained in each of the countries was highly
442 variable, and not proportional to the country size.

443 The results of this study are very important, because they pointed the complexity that
444 is involved in people's food choices and highlighted different factors that influence those
445 choices. These findings are fundamental to the development of policies and strategies that
446 encourage people to adopt healthier dietary patterns. These actions could be implemented
447 at national levels or even in the ambit of multinational policies aimed to diminish the
448 burden of chronic diseases.

449 Although this work highlights some trends that characterize the general factors
450 influencing the food choices around the Mediterranean, further research is necessary, and
451 in the ambit of the ongoing project some similar studies are being undertaken in other
452 countries, all around Europe and also in America and African countries.

453

5. Acknowledgment

This work was prepared in the ambit of the multinational project EATMOT from CI&DETS Research Centre (IPV - Viseu, Portugal) with reference PROJ/CI&DETS/CGD/0012, co-financed by Caixa Geral de Depósitos.

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