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3
4 **THE MOTIVATIONS THAT DEFINE EATING PATTERNS IN SOME**
5 **MEDITERRANEAN COUNTRIES**

6
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27

28

Abstract

29

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.

34

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.

38

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).

49

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

51

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

55

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

57

58 **1. INTRODUCTION**

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

76 A healthy diet helps to protect against malnutrition in all forms, as well as
77 noncommunicable diseases (NCDs), such as diabetes, heart disease, stroke and cancer
78 (World Health Organization, 2018a). Nowadays, people are more aware about the
79 association between the quality of the diet and their personal health (van Buul et al.,
80 2017). However, despite this knowledge, even health-conscious consumers often make
81 unhealthy food choices, because the knowledge about a healthy eating not always
82 translates into a dietary change or into better eating habits (Mai and Hoffmann, 2014).
83 During a day, individuals are confronted with several food choices, which are driven by
84 reasons that they are not fully aware. Food choice is a complex system influenced by
85 multiple factors related to the product (such as sensory properties), and also to the
86 consumer (like for example restrictions or preferences) as well as the consumption
87 context (culture, religion, health, convenience and price, biology, emotions, marketing,
88 political and also environmental concerns) (Kaya, 2016; Pelly et al., 2018; Stasi et al.,
89 2018). Among the different motivations that influence food choices, culture is one of the
90 most important and explains the differences in food preferences across countries and
91 cultures (Rozin, 2007; Siegrist et al., 2015). In fact, food consumption is closely related
92 to the social context, since food, through its symbolic value, can help to successfully
93 reveal people's identities and demonstrate who they are and where they belong within
94 society (Barauskaite et al., 2018; Landström et al., 2009). Hence, given the urgency to
95 improve people's eating habits (Leng et al., 2017), it is crucial to understand their food
96 motivations, so that the policy recommendations can be more effective.

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

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

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

113

114 **2. DESCRIPTION OF OBSERVATIONAL STUDY**

115 **2.1. Questionnaire used for assessment of eating motivations**

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

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

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

166 **3. RESULTS**

168 **3.1. Sample characterization**

169 The sample was composed of 4708 participants, aged between 18 and 90 years old,
170 being on average 34.81 ± 14.66 years, from which 68.1% were female and 31.9% were
171 male. As it can be observed in Table 1, the participants were classified into age categories
172 according to: young adults ($18 \leq \text{age} \leq 30$), corresponding to 49.3%; average adults (31
173 $\leq \text{age} \leq 50$), accounting for 32.7%; senior adults ($51 \leq \text{age} \leq 64$), representing 15.4%; and
174 finally elderly (≥ 65), which accounted for 2.6% of the sample.

175

Table 1. Sociodemographic characterization.

Sociodemographic Data		Percentage (%)
Age	Young adults: $18 \leq \text{age} \leq 30$	49.3
	Average adults: $31 \leq \text{age} \leq 50$	32.7
	Senior adults: $51 \leq \text{age} \leq 64$	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

177

178 Most of the participants (59.5%), had a university degree and only 2.0% of them had
179 the primary school as the highest level of education achieved. As for the civil state, 48.2%
180 of the participants were single, 45.4% were married or lived together as a marital couple,
181 3.9% were divorced or separated and 2.5% were widowed. Regarding the living

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

185 Concerning the job situation, most of the participants were students (53.5%), 31.8%
186 were unemployed, 6.1% were employed, 4.8% were working students and 4.2% were
187 retired (Table 1). As for the participants' professional activity or field of studies, the
188 majority of the participants, 51%, did not have a professional activity or field of studies
189 related to any of the options suggested in the questionnaire (nutrition, food science,
190 agriculture, sport, psychology, activities related to other health areas), 20.5% had a
191 professional activity or field of studies related to other health areas, 9.1% had a
192 professional activity or field of studies related to food, 9% had a profession or studies
193 related to sports, 3.9% had a professional activity or field of studies related to nutrition,
194 3.8% had a professional activity or field of studies related to agriculture and 2.7% had an
195 activity or studies in the psychology area.

196 Regarding the anthropometric data for the sample at study, the height was for the
197 whole sample on average 1.7 ± 0.1 meters (1.65 ± 0.07 m for women and 1.79 ± 0.08 m
198 for men), and the weight was on average 68.64 ± 14.34 kg (63.60 ± 11.49 kg for women
199 and 79.22 ± 13.87 kg for men). The Body Mass Index (BMI) was calculated as weight
200 (kg) divided by the square of height (m^2) and then classified according to the standards
201 of the International Classification: underweight ($BMI < 18.5 \text{ kg/m}^2$), normal weight (18.5
202 $\leq BMI \leq 24.99 \text{ kg/m}^2$), overweight ($25 \leq BMI \leq 29.99 \text{ kg/m}^2$) and obese ($BMI \geq 30.00$
203 kg/m^2) (World health Organization, 2006). The results showed that the BMI for the whole
204 sample was on average equal to $23.71 \pm 4.07 \text{ kg/m}^2$, which means that in general the
205 participants had a normal weight. When analysed by gender, it was observed that the

206 average values for women were lower ($23.28 \pm 4.12 \text{ kg/m}^2$) than those for men ($24.64 \pm$
 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.

BMI¹ Class	Portugal	Italy	Croatia	Greece	Egypt
	(%)	(%)	(%)	(%)	(%)
Underweight (BMI < 18.5)	5.5	5.9	3.4	2.8	1.5
Normal Weight ($18.5 \leq \text{BMI} \leq 24.9$)	79.3	63.2	59.9	68.3	49.3
Overweight ($25 \leq \text{BMI} \leq 29.9$)	11.3	24.0	30.1	23.5	33.7
Obesity (BMI ≥ 30)	3.2	6.8	6.6	5.4	15.4

215 ¹BMI = 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

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

232 A balanced diet is fundamental for the maintenance of health (Schwingshackl et al.,
233 2018). Therefore, the participants were asked about how often they believed they
234 practiced a balanced diet, and as it can be observed in Table 5, 37.8% considered that
235 they do it frequently, 36.6% sometimes, 12% rarely, 7.8% never while 5.8% of the
236 participants considered that they always practice a balanced diet. This questions intended
237 to make a self-evaluation of their own eating patterns, but it was based on each one's
238 individual perception of what they consider to be a healthy diet. Therefore, the results
239 must be read as defining an approximation to a heathy diet.

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

246

247

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	

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

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

259

260

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

261

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

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

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

274

275 **3.2. Eating motivations**

276 Table 5 presents the participants' eating motivations by country and, in general
277 regardless of the country, the participants' food choices were not heavily influenced by
278 any of the considered types of motivations. For Portugal and Italy, the participants' food
279 choices were more influenced by environmental and political motivations, while in
280 Croatia and Egypt the most important motivation was health, and in Greece the
281 participants' were more influenced by health, as well as environmental and political
282 motivations. The results of the ANOVA test showed that those differences between
283 countries were statistically significant (Health: $F = 113.577$, $p < 0.001$; Emotional: $F =$
284 82.377 , $p < 0.001$; Economic and availability: $F = 66.832$, $p < 0.001$; Social and cultural:
285 $F = 174.475$, $p < 0.001$; Environmental and political: $F = 193.268$, $p < 0.001$; Marketing
286 and commercial: $F = 238.103$, $p < 0.001$). These results are not surprising since health is
287 an important determinant for people's food choices (Birkenhead and Slater, 2015).
288 Additionally to health motivations, consumers' are more conscientious about the impact
289 of their diets on the environment and also about the importance of adopting diets that are
290 more sustainable from an environmental point of view (Hoek et al., 2017). In a study by
291 Markovina et al. (Markovina et al., 2015) it was found that the most important food choice

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

300

301

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

302

303

304

305

¹Scale 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%).

306

307 As it can be observed in Table 5, which relates also eating motivations with physical
308 activity, the motivation with a higher average score was health, 0.7 ± 0.5 , for the
309 participants who practiced physical activity moderately (2-3 times per week). Moreover,
310 the results also showed that the participants who practiced physical activity moderately
311 seemed to have more environmental and political concerns when choosing their food
312 (0.6 ± 0.6). On the other hand, the participants who practiced physical activity moderately
313 were less influenced by emotional, social & cultural or marketing & commercial
314 motivations. The results of the ANOVA test showed that the differences between groups
315 were statically significant (Health: $F = 98.949$, $p < 0.001$; Emotional: $F = 24.870$, p
316 < 0.001 ; Economic and availability: $F = 16.336$, $p < 0.001$; Social and cultural: $F = 9.339$,
317 $p < 0.001$; Environmental and political: $F = 45.606$, $p < 0.001$; Marketing and commercial:
318 $F = 112.735$, $p < 0.001$). Another interesting result is the fact that the food choices of the
319 participants who practiced physical activity moderately or intensively were less
320 influenced by emotional concerns, when compared to the other groups of physical
321 activity. In the study of Loprinzi and his colleagues (Loprinzi et al., 2014) it was found
322 that the participants who practiced physical activity according to the guidelines provided
323 by the authors of that study were more likely to adopt a healthy diet.

324 Table 6 shows the participants' eating motivations according to gender and, as it can
325 be observed, for women the most important motivation was health, while men's food
326 choices were mainly influenced by health as well as environmental and political concerns.
327 The results of the T-test showed that those differences between genders were statistically
328 significant for almost every type of motivation, with the exception of social and cultural
329 motivations ($p = 0.21$). Nevertheless, since the average scores were always lower than
330 1.5, for both men and women, their food choices were not much influenced by none of

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

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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

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

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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

346 choices of the participants who followed a special diet was health (0.6 ± 0.5), being this
347 significantly higher than for who did not follow any special diet (0.5 ± 0.6). This finding
348 indicates that the participants were aware of the impact of dietary patterns on the
349 development or prevention of diseases, so much that those who followed a special diet
350 did it strongly motivated by health concerns. Many published studies associate special
351 diets with health issues (Braha et al., 2017; Coelho et al., 2019; Guallar-Castillón et al.,
352 2012; Lavallee et al., 2019; Satija and Hu, 2018; Yu et al., 2018). The results of the T-
353 test showed that the differences in the food choice motivations according to the
354 participants' dietary regimen were statistically significant, with the exception of the
355 economic & availability motivations ($p = 0.218$), as well as social & cultural motivations
356 ($p = 0.052$).

357 As it can be observed in Table 7 the food choices of the participants who had chronic
358 diseases were more influenced by health motivations (0.5 ± 0.5), followed by the
359 environmental and political motivations (0.4 ± 0.7). For the participants who did not have
360 any chronic disease, the major determinants for their food choices were health (0.6 ± 0.6)
361 and also environmental & political concerns (0.6 ± 0.7). Furthermore, the average score
362 for the health motivations among the participants who did not have any chronic disease
363 was higher when compared to those who suffered from chronic diseases, meaning that
364 having a health problem might not be motivating enough to eat healthier. Therefore, it
365 might be due to inappropriate food choices that these diseases arise and progress in these
366 individuals, who are reckless regarding their health. Again there were found significant
367 differences in the food choice motivations of the participants who had chronic diseases
368 and those who had not, with the exception of economic & availability motivations ($p =$
369 0.438), as well as environmental & political motivations ($p = 0.631$). According to other
370 studies, having a chronic disease is a factor that may change people's eating habits and

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

374

375 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

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

379 According to Sommer et al. (2012), approximately 35% of the population modify
380 their diet because of adverse reactions to food. In the present study, not surprisingly, there
381 were found significant differences between the food choices of the participants who had
382 food allergies or intolerances and those who had not, regarding the health motivations (p
383 <0.001), economic & availability motivations ($p = 0.031$), environmental & political
384 concerns ($p <0.001$) and marketing & commercial motivations ($p <0.001$) (Table 7). The
385 results further showed that the food choices of the participants who had food
386 allergies/intolerances were primarily affected by health motivations (0.5 ± 0.5), while the
387 food choices of those who had not were more affected by health (0.6 ± 0.5), as well as
388 environmental & political determinants (0.6 ± 0.7). However, it is important to refer that
389 the food choices of the participants who did not have allergies or food intolerances were
390 affected by health concerns to a higher extent, when compared to those who suffered from
391 them. This is a surprising result and, up to our knowledge, no previous works were found
392 that could explain this, since people with problems motivated by the ingestion of certain
393 types of food should be more careful as to what they eat and the impact on their wel-
394 being.

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

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

408

409 **4. CONCLUSION**

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

420 Factors such as gender, level of physical activity, dietary regimen, absence of a
421 chronic disease, presence of food allergies or intolerances and the fact that the participants
422 had already experienced an episode of an eating disorder, were proved to influence the
423 participants' food choices. This research has also shown that women tended to be more
424 influenced by eating motivations than men, with significant differences between genders,
425 and that the participants who practiced physical activity moderately were more concerned
426 about the health and sustainability of their diets than with emotional, social, or even
427 marketing issues. There were also observed significant differences between the
428 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

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458

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