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THE MOTIVATIONS THAT DEFINE EATING PATTERNS IN SOME

MEDITERRANEAN COUNTRIES

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28   **Abstract**

29   **Purpose:** This study is part of the international project EATMOT, designed to investigate

30   several issues related to food choice and consumption patterns in different countries,

31   including health related factors; economic and availability aspects; emotional

32   determinants; social, cultural and religious influences; marketing and advertising

33   campaigns and finally environmental concerns.

34   **Methodology:** The present study was based on a questionnaire that was exclusively

35   prepared for the project, and which was applied to collect data in different countries, in

36   particular Croatia, Egypt, Italy, Greece and Portugal, which are typically associated with

37   the Mediterranean diet.

38   **Findings:** The results obtained allowed, in general, to conclude that in all 5 countries the

39   motivations related to health as well as environment & politics were the more relevant to

40   determine people's eating habits (scores varying from 0.3 to 0.7). Women were more

41   influenced by eating motivations than men, and people with moderate exercise were more

42   susceptible to health and environmental motivations and less to emotional, social or

43   marketing motivations ($p < 0.001$ in all cases). It was also observed that people who

44   adopted a special diet were more prone to eating motivations and that the emotional

45   motivations were more pronounced in people with eating disorders ($p < 0.001$). Finally,

46   people without chronic diseases or allergies were even more influenced by health

47   motivations than those who actually suffered from these health problems ($p < 0.001$ in

48   both cases).

49   **Originality/Value:** This work is important due to the multinational coverage, thus

50   allowing to evaluate the most relevant factors that influenced the food choices of the

51   populations around the Mediterranean Sea, sharing the common link to the Mediterranean

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.

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

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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 unhealthier 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

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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.

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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.

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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.

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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%.

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167   **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 ($18 \leq$ age ≤ 30), corresponding to 49.3%; average adults (31

173    $\leq$ age ≤ 50), accounting for 32.7%; senior adults ($51 \leq$ age ≤ 64), representing 15.4%; and

174   finally elderly (≥ 65), which accounted for 2.6% of the sample.

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Table 1. Sociodemographic characterization.

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

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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

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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 kg/m^2), normal weight (18.5

202　$\leq$ BMI ≤ 24.99 kg/m^2), overweight ($25 \leq$ BMI ≤ 29.99 kg/m^2) and obese (BMI ≥ 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 ± 4.07 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 ± 4.12 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.

BMI[1] Class	Portugal (%)	Italy (%)	Croatia (%)	Greece (%)	Egypt (%)
Underweight (BMI < 18.5)	5.5	5.9	3.4	2.8	1.5
Normal Weight ($18.5 \leq$ BMI ≤ 24.9)	79.3	63.2	59.9	68.3	49.3
Overweight ($25 \leq$ 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

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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

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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).

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249   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

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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

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%).

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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

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).

335

336 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

337 [1]Scale from -2 (no influence) to +2 (very high influence); The values stand for mean ± standard
338 deviation. [2]T-test for independent samples (level of significance 5%).
339

340 Since people's dietary regimen is one of the determinants that affects their food

341 choices (Hoefkens et al., 2011), it was also analysed if there were differences in the

342 participants' food choices according to their dietary regimen. Table 6 also presents the

343 participants' motivations for food choices by dietary regimen and, in general, the food

344 choices of the participants who followed a special diet were more influenced by different

345 factors when compared with people with a regular diet. The major motivation for the food

17

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

376 [1]Scale from -2 (no influence) to +2 (very high influence); The values stand for mean ± standard
377 deviation. [2]T-test for independent samples (level of significance 5%).
378

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

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

21

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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