Eating Patterns and Adherence to the Mediterranean Diet: A Cross-Sectional Study in Albania

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Abstract

Objective: To evaluate the level of adherence to the Mediterranean diet pattern overall and to specific dietary components, among Albanian adults. Design and Setting: This is a cross-sectional study carried out during June - July 2019 in Vlora and Fieri cities, Albania. The study population consisted of 209 adults, randomly selected. Participation rate was 73%. Adherence to the Mediterranean diet was assessed via an online questionnaire based on the previously validated and translated 14 item questionnaire PREDIMED (Prevención com Dieta Mediterránea). **Results:** Most of the participants enrolled in the study were women (63%) and between 18-35 years of age (76.1%) . The majority of the participants had moderate adherence to Mediterranean diet (57.4%) and only 14.4% of them had high adherence. Higher adherence was reported for the use of olive oil as the primary culinary fat (72.7%), whereas lowest adherence was achieved for wine consumption (12.4%). Mean Mediterranean diet score did not differ significatly between women and men. **Conclusions:** There is a worldwide trend to adopt unhealthy eating behaviour and the results of this study indicate that eating patterns and lifestyle habits in the population have to be improved. We recommend that there is a strong need for effective strategies to promote healthy behaviour and to implement Mediterranean diet by more individuals.

Keywords: Albania, Mediterranean Diet, Adherence, Healthy Diets, Eating Patterns

Introduction

The Mediterranean diet, represents the dietary pattern usually consumed by populations in the Mediterranean basin. Due to the various geographical regions of the Mediterranean, there are many variations of the Mediterranean diet, in which food cultures are influenced by socio-cultural, religious and economic factors (McManus et al 2001; Dernini and Berry 2016).

The Mediterranean diet has been widely reported as an ideal dietary pattern. It has been associated with health benefits and better quality of life. Also, its sustainability makes Mediterranean diet an attractive diet to promote to Western populations (McManus et al 2001; Willett 2006) .

The main components of the diet are the use of olive oil as the main type of added and cooking lipid, a high consumption of plant-based foods (vegetables, legumes, fruits and nuts), a moderate consumption of fish and dairy products (mainly as cheese and yogurt), moderate amounts of wine during meals and a low consumption of meat (Yahia N et al 2008; Baldini et al 2009; Ortiz-Moncada et al 2012; CIHEAM F 2015).

Various epidemiological studies have analysed the benefits of Mediterranean diet in comparison with other types of diets (Haveman-Nies et al 2002; Knoops et al 2006). These studies have shown that following the Mediterranean diet is associated with decreased risk of cardiovascular diseases (Hu 2002), certain types of cancer (Murtaugh et al 2007), diabetes, asthma, obesity and neurodegenerative diseases (Goulet et al 2003; Tyrovolas and Panagiotakos 2010; Buckland et al 2011; Sexton et al 2013). Moreover, people with good adherence to the Mediterranean diet have a better quality of life and greater life expectancy (Sofi et al 2008; Henríquez Sánchez et al 2011).

Therefore, it is important to evaluate the degree of adherence to Mediterranean diet through accurate measurement tools, such as dietary scores. Scores are useful instruments, based on dietary components, combining foods and nutrients to obtain valid operational variables that analyse the association between the quality of the diet and its health effects (Zazpe I et al 2008; Rumawas et al 2009; Benítez-Arciniega et al 2011). Several scores are used to measure the degree of adherence to Mediterranean diet. The first and most widely used score was created by Trichopoulou et al (1995) . In this study we used the Validated 14-item questionnaire of the PREDIMED study, which is a brief tool assessing only a small number of foods, measured in servings/day or servings/week, that provides immediate feedback, accuracy and reliability for assessing Mediterranean diet adherence (Schröder et al 2011; Martínez-González et al 2012) .

However, in spite all these beneficial effects of the Mediterranean diet, studies indicates that there has been a rapid decline in Mediterranean diet pattern adherence in recent decades (Burlingame and Dernini 2011; Bonaccio

et al 2016; Dernini et al 2017) . Although several factors contribute to the phenomenon of nutrition transition, it seems that the change to modern lifestyles, particulary among younger, plays a major role in this shift from the traditional Mediterranean diet (Pelucchi et al 2010; Burlingame and Dernini 2011).

Albanian cousine falls in the category of the "Mediterranean diet", but data on the dietary of adults, are lacking. Therefore, the aim of the study was to investigate the level of adherence to the traditional Mediterranean diet pattern overall and to specific dietary components, among Albanian adults; thus providing evidence for intervention programs targeting this often overlooked age group.

Methods

Aim

The aim of this study was to investigate the level of adherence to the traditional Mediterranean diet pattern among Albanian adults.

Hypothesis

There is a positive relationship between educational level and adherence to the Mediterranean diet.

Study's Population and Sample

During June-July 2019, a cross-sectional survey was conducted among 209 adults (131 women, 78 men) in the cities of Vlora and Fieri, Albania. Simple Random Sampling was used during the selection of the participants. Sample size determination was calculated to achieve a confidence interval of 95%, alpha level of 0.05, and a desired level of precision of 2.5%, which gave a total sample size of 206. However, 287 potential participants were invited to take part in the study. Eligibility criteria were: (a) being currently residents in the cities of Vlora and Fieri, (b) more than 18 years old, (c), participating in the study voluntarily, (d) and actively cooperating to complete the questionnaire. Exclusion criteria were age less than 18 years of age, nonresidents and incomplete questionnaires.

From all the 287 participants initially enrolled in the study, 57 refused to participate, while 21 were excluded because of incomplete questionnaires, resulting in a final sample of 209 participants (response rate ≈ 73%).

Survey Method

Data were collected via an online questionnaire via social networks or face to face interview from health professionals. The questionnaire was anonymous and it was divided into two sections. The first included socio-demographic data, where the participants were asked to report their gender,

age, level of education and occupation. The second section focused on dietary patterns and adherence of the participants to the Mediterranean diet.

Mediterranean diet adherence was assessed using a validated food frequency questionnaire. The original tool was translated into Albanian. The standardized procedure of translation and back translation was followed (Cha et al., 2007). Two independent bilingual Albanian – Spanish healthcare academicians, independently translated the original instrument. Back translation by a bilingual Albanian – Spanish Phd expert was carried out. Each translated versions were evaluated by the research team, until agreement on final translation was reached.

The Albanian version was reviewed by experts for its clarity, content validity, feasibility and applicability and all necessary modifications were done. The final Albanian version was pilot tested and minor modifications were implemented according to the recommendations from the participants. The reliability of the instrument was determined through the Cronbach's Alpha and the reliability of this instrument was (r=0.833).

Adherence to the Mediterranean diet

Adherence to the Mediterranean diet was assessed via an 14-item food frequency questionnaire of the PREDIMED study (Table 1) that requested participants to report the frequency of consumption of main components of the Mediterranean diet. The scores were calculated as follows: Participants would be given a score of 1 if the participants consumed more than 3 servings per week of legumes and fish; for vegetables, fruits and fruit juices criteria for 1 point was the consumption of more than 2 servings/day and more than 3 servings/day respectivelly.

For the consumption of components which are consumed less frequently in the Mediterranean diet (red meat and meat products, poultry and whole-fat dairy products, butter, sweet or carbonated beverages), a score 1 was assigned for reported consumption of the above options for less than 1 serving/day. For wine, a score of 1 was assigned for consumption of more than 7 glasses of wine per week.

Short questions were used to inquire on food habits for two of the items: Do you use olive oil as the principal source of fat for cooking? and Do you prefer to eat chicken, turkey or rabbit instead of beef, pork, hamburgers or sausages?Criteria for 1 point was answering ''Yes''.

The resulting total score ranged from 0 to 14 divided in three groups indicating low adherence (score= 0-5), moderate adherence (score=6-9) and high adherence (score=10-14) to Mediterranean diet.

Table 1: Validated 14-item Questionnaire of Mediterranean diet adherence.

Questions	Criteria for 1 point
1. Do you use olive oil as main culinary fat?	Yes
2. How much olive oil do you consume in a given day (including oil used for frying, salads, out-of-house meals, etc.)?	≥4 tbsp
3. How many vegetable servings do you consume per day? (1 serving : 200 g [consider side dishes as half a serving]	≥2 (≥1 portion raw or as a salad)
4. How many fruit units (including natural fruit juices) do you consume per day?	≥3
5. How many servings of red meat, hamburger, or meat products (ham, sausage, etc.) do you consume per day? (1 serving: 100–150 g)	≤1
6. How many servings of butter, margarine, or cream do you consume per day? (1 serving: 12 g)	<1
7. How many sweet or carbonated beverages do you drink per day?	<1
8. How much wine do you drink per week?	≥7 glasses
9. How many servings of legumes do you consume per week? (1 serving : 150 g)	≥3
10. How many servings of fish or shellfish do you consume per week? (1 serving 100–150 g of fish or 4–5 units or 200 g of shellfish)	≥3
11. How many times per week do you consume commercial sweets or pastries (not homemade), such as cakes, cookies, biscuits, orcustard?	<3
12. How many servings of nuts (including peanuts) do you consume per week? (1 serving 30 g)	≥3
13. Do you preferentially consume chicken, turkey, or rabbit meat instead of veal, pork, hamburger, or sausage?	Yes
14. How many times per week do you consume vegetables, pasta, rice, or other dishes seasoned with sofrito (sauce made with tomatoand onion, leek, or garlic and simmered with olive oil)?	≥2

Statistical analyses

Descriptive statistics (M, SD, N and %) were used to explore demographic characteristics, and eating habits of participants. We compared the characteristics of participants according to three categories of adherence to the Mediterranean diet (≤5, 6–9 and ≥10 points of the 14-item questionnaire). Independent samples t-test, one-way ANOVA and chi-squared tests were used, as appropriate, to investigate any differences between males and females and to evaluate the differences among the three categories of adherence to the Mediterranean diet and their statistical significance. P- value of less than 0.05 was considered statistically significant. Data were analysed using SPSS v.19.0 (SPSS Inc., Armonk, NY) and Microsoft Office Excel 2007.

Results

Sample Size and Characteristics

A total of 209 participants completed the survey, which included 131 women (63%) and 78 men (37%). The majority of participants were between 18 to 35 years of age and respondents over 65 years old were less represented than other age classes. According to their educational level 75.1% of the participants had completed university and only 3.8% of them had only primary school. Regarding occupation, a considerable percentage of the sample were students (≈42%) and the remaining part had different occupational statuses such as nurses, lawyers, engineers, farmers, workers, house keepers, retired ect. (Table 2).

Table 2. Socio-Demographic Characteristics

Gender	Female	Male	Total
N	131(62.7)	78(37.3)	209
Age			
18-35 years old	106 (80.9)	53 (67.9)	159 (76.1)
36-50 years old	13 (9.9)	8 (10.3)	21 (10.1)
51-65 years old	8 (6.1)	9 (11.5)	17 (8.1)
Over 65 years old	4 (3.1)	8 (10.3)	12 (5.7)
Educational level			
High	103 (78.6)	54 (69.2)	157 (75.1)
Secondary	23 (17.6)	21 (26.9)	44 (21.1)
Primary	5 (3.8)	3 (3.9)	8 (3.8)
Occupation			
Students	55 (41.9)	29 (37.2)	84 (40.2)
Other	76 (58.1)	49 (62.8)	125 (59.8)

*Categorical variables are presented as percentages in parentheses.

Adherence to the Mediterranean Diet

As shown in **Table 3**, the mean Mediterranean diet score for the total study sample was 6.8 (SD 2.3), indicating moderate adherence to the Mediterranean diet. Mean values (± SD) for the 14-item score were 6.6 ± 2.3 for women and 7.2 ± 2.3 for men, with men having a higher score compared to women, but statistically nonsignificant (p=0.056). The lowest score achieved by the participants from the Mediterranean diet adherence questionnaire was 2 points (n=1) and the highest 12 points (n=30).

Table 3. Mean total Mediterranean diet score and differences in total Mediterranean score according to demographic characteristics .

	Total (n=209) Mean (Sd)	Females (n=131) Mean (Sd)	Males (n=78) Mean (Sd)	P*
Total Mediterranean diet score	6.8 (2.3)	6.62 (2.3)	7.21 (2.3)	0.056
Age group				0.0013
18-35 years old	6.48 (2.1)	6.3 (2.1)	6.7 (2.1)	
36-50 years old	8.43 (2.3)	7.7 (2.6)	9.5 (2.1)	
51-65 years old	8.29 (2.5)	8.25 (2.6)	8.3 (2.5)	
>65 years old	7.17 (1.9)	7.5 (2.3)	7.0 (1.7)	
Occupation				<0.00005
Students	6.06 (2.1)	5.6 (2.03)	6.9 (1.8)	
Others	7.38 (2.3)	7.3 (2.3)	7.4 (2.5)	
Educational level				0.47
Higher	6.73 (2.3)	6.4 (2.3)	7.4 (2.2)	
Secondary	7.2 (2.4)	7.4 (2.4)	7.09 (2.5)	
Primary	7.1 (1.6)	7.2 (1.9)	6.0 (2.1)	

*Data were presented as mean ± SD. Differences between genders were examined using the independent samples *t*-test.

There were no differences between women and men in mean Mediterranean diet score according to their educational level (Table 3), but there were significant differences between men and women for all age groups categories, with men in the age group 18-35 years old being in the "high adherence" category compared to women (6.7% versus 6.1%, resp. P=0.0013).

Students exhibited a lower adherence to the Mediterranean diet compared to other categories of the occupational status (6.06 vs 7.38, p<0.00005). (Table 3). Overall, 57.8% of the students showed moderate adherence to the diet, 38.6% of them low adherence and only 3.6% high adherence (Table 4).

Table 4. Characteristics of participants by adherence to the Mediterranean diet

	Woman				Men			
Adherence	0-5	6-9	10-14	P*	0-5	6-9	10-14	P*
N	41	74	16		18	46	14	
			Educational level					
High	34(26)	58(44.2)	11(8.3)	0.14	11(14.1)	33(42.3)1	10(12.8)	0.56
Secondary	6(4.6)	13(9.9)	4(3.1)		6(7.7)	1(14.1)	4(5.1)	
Primary	1(0.8)	3(2.3)	1(0.8)		1(1.3)	2(2.6)	0(0)	
Age								
18-35 years old	37(28)	61(46.7)	8 (6.1)	0.02	16(20.5)	30(38.5)	7 (8.9)	0.005
36-50 yearsold	2(1.5)	8(6.1)	3 (2.3)		0(0)	5(6.4)	3(3.8)	
51-65 years old	1(0.8)	3(2.3)	4 (3.1)		1(1.3)	5(6.4)	3(3.8)	
> 65 years old	1(0.8)	2(1.5)	1(0.8)		1(1.3)	6(7.7)	1(1.3)	

Occupation			0.00001				0.00001
Students	26(19.8)	29(22.1)	0(0)	7(9.0)	19(24.4)	3(3.8)	
Others	15(11.5)	45(34.4)	16(12.2)	11(14.1)	27(34.6)	11(14.1)	

*One-way ANOVA tests (continuous variables) or chi squared tests (categorical variables).

Consumption of main components of the Mediterranean diet

When looking at categories of adherence in all groups, about half (57.4%) were in the "intermediate adherence" to the Mediterranean diet category (score 6-9), 28.2% were in the "low adherence" category (total score of ≤5), and 14.4% were in the "high adherence" category (total score 10-14) (Table 5).

Table 5. Adherence of the participants for each of the components of the Mediterranean diet

	Total (n=209)	Females (n=131)	Males (n=78)	P*
Adherence to the Mediterranean diet				0.056
Low (score=0-5)	59 (28.2)	41 (31.3)	18 (23.1)	
Moderate (score=6-9)				
High (score=10-14)	120 (57.4)	74 (56.5)	46 (59)	
	30 (14.4)	16 (12.2)	14 (17.9)	
Olive oil as main culinary fat				0.29
Low(score=0)	57 (27.3)	39(29.8)	18(23.1)	
High(score=1)	152(72.7)	92(70.2)	60(76.9)	
Olive oil ≥4 tbsp/day				0.62
Low (score=0)	108(51.7)	66(50.4)	42(53.8)	
High(score=1)	101(48.3)	65(49.6)	36(46.2)	
Vegetables ≥2 servings/d				0.08
Low (score=0)	99(47.4)	68(51.9)	31(39.7)	
High(score=1)	110(52.6)	63(48.1)	47(60.3)	
Fruits ≥3 servings/d				0.4
Low (score=0)	107(51.2)	70(53.4)	37(47.4)	
High(score=1)	102(48.8)	61(46.6)	41(52.6)	
Red meat <1/d				0.04
Low (score=0)	63(30.1)	46(35.1)	17(21.8)	
High(score=1)	146(69.9)	85(64.9)	61(78.2)	
Butter <1/d				0.08
Low (score=0)	27(12.9)	21(16.0)	6(7.7)	
High(score=1)	182(87.1)	110(84.0)	72(92.3)	
Sweet or carbonated beverages <1/d				0.9
Low (score=0)	76(36.4)	48(36.6)	28(35.9)	
High(score=1)	133(63.6)	83(63.4)	50(64.1)	
Wine adherence				0.006
Low (score=0)	183(87.6)	121(92.4)	62(79.5)	
High(score=1)	26(12.4)	10(7.6)	16(20.5)	
Legumes ≥3/wk				0.056
Low (score=0)	135(64.6)	91(69.5)	44(56.4)	
High(score=1)	74(35.4)	40(30.5)	36(43.6)	
Fish ≥3/wk				0.32

Low (score=0)	163(78.0)	105(80.2)	58(74.4)	
High(score=1)	46(22.0)	26(19.8)	20(25.6)	
Sweets ≤2/wk				0.42
Low (score=0)	141(67.5)	91(69.5)	50(64.1)	
High(score=1)	68(32.5)	40(30.5)	28(35.9)	
Nuts adherence				0.74
Low (score=0)	179(85.6)	113(86.3)	66(84.6)	
High(score=1)	30(14.4)	18(13.7)	12(15.4)	
Poultry instead of red meat?				0.005
Low (score=0)	39(18.7)	32(24.4)	7(9.0)	
High(score=1)	170(81.3)	99(75.6)	71(91.0)	
Vegetables, pasta, rice/week				0.61
Low (score=0)	85(40.7)	55(42.0)	30(38.5)	
High(score=1)	124(59.3)	76(58.0)	48(61.5)	

*Differences between genders were examined using the Chi-square test.

Conclusion

In this study participants reported moderate levels of adherence to the Mediterranean diet, with higher adherence in participants between 18-35 years old. Students had a poor adherence to Mediterranean diet compared to the other participants.

To our knowledge, there are a few studies in Albania on eating patterns and adherence to the Mediterranean diet in adults. Our results support the proposed shift from traditional healthy diets to more unhealthy eating patterns in Mediterranean countries. Based on this findings, future interventions and public health strategies should be implemented, focusing not only in promoting consumption of several components of the Mediterranean diet, but also on cultural and social dimensions that characterize its heritage.

Further research on the main determinants of individual adherence to Mediterranean diet would make a significant contribution to extend current evidence on this issue.

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