THE USE AND KNOWLEDGE OF OLIVE OIL AND OTHER LIPIDS IN THE POPULATION

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Abstract

Evidence suggests that olive oil consumption is associated with a decreased prevalence of cardiovascular disease and certain cancers. The purpose of this study was to assess the intake and knowledge of olive oil and other lipids in a group population. Using an IRB-approved protocol, (The Georgia State University Institutional Review Board), volunteered from different professions and students from the University of Medicine completed a questionnaire on lipid and knowledge and eating behavior. Results were assessed to determine if students were able to accurately answer questions on the contents of different lipids, and also to determine the consumption behaviors of different lipids. Statistical comparisons were made between non graduate and graduate persons in different professions (nurses, IT, economists, social work, and other) and between students. It was hypothesized that eating behaviors would overemphasize unhealthy lipids. Lipids assessed included: olive oil, butter, peanut oil, corn oil, margarine, sunflower oil, and soybean oil. There were no statistically significant differences between the ratios of consumed lipids labeled as 'good', and lipids labeled as 'bad'. There were also no statistically significant differences in the presence of 'good' to 'bad' lipids in the subjects' kitchens. This study focused on a group of people with different level of education. One might assume that such a population would be sensitive and knowledgeable about key dietary factors that may influence disease risk. The purpose of this study is to evaluate the population and students' eating behaviors and knowledge of lipids, and to review the literature on the health benefits of olive oil.

Key words: *Lipids, health benefits of olive oil, diets*.

INTRODUCTION

The olive tree, *Olea Europaea,* is native to the Mediterranean basin and parts of Anatolia (Western Asia). There is evidence that olive oil, which is produced from the compressed fruits of the olive tree, may have powerful therapeutic benefits. In addition, there are number of studies on the Mediterranean-style diet that support the olive oil potential for reducing oxidative damage associated disease risks. Oleic acid and phenolic compounds, both of which are bioavailable to humans are the active olive oil components that may enhance health and reduce disease risk. Phenolics, which occur in abundant levels in olive oil, have antioxidant activity while oleic acid is associated with lower cancer risk. In addition, there is evidence that olive oil and its components may reduce the risk of coronary heart disease, high blood pressure and hyperlipoproteinemia.

Oleic Acid

Oleic acid, a monounsaturated omega-9 fatty acid is found in various animal and vegetable sources. Approximately 55-80% of olive oil is composed of oleic acid. The single double bond of oleic acid makes it more stable to oxidation (Machowetz et al., 2007; Tripoli et al., 2005). A study has established that oleic acid intake might suppress the over-expression of some oncogenes, which play a key role in the etiology of several human cancers, including breast, ovarian, and gastric carcinomas (Menendez et al.,2006). Furthermore, oleic acid oil intake positively affects the human immune system and certain inflammatory disorders (Puertollano et al., 2007).

Phenolic Compounds

Phenolic constituents in olive oil can be divided in three categories: simple phenols, secoiridoids and lignans (Fabiani et al., 2006). The major phenols include hydroxytyrosol, tyrosol, oleuropein, and ligstroside (Fabiani et al., 2006). These phenolic compounds have antioxidant activity, which enable them to reduce the potentially damaging effects of free radicals, such as peroxide (Machowetz et al., 2007). There is also evidence that phenols may exert protective action against carcinogenesis.

Mediterranean Diet

The Mediterranean diet contributes to better health and quality of life for those who follow it (Tur et al., 2004). The diet is characterized by a relatively high intake of fruits, vegetables, nuts, olive oil, fish and a low intake of saturated fat. Even though the Mediterranean diet is consumed in the large parts of the Mediterranean Basin, a progressive change from this typical diet is observed. An epidemiological study demonstrated that some Mediterranean countries have increased their consumption of animal products and saturated fat. However, olive oil persists as the main dietary fat in the Mediterranean region, which may explain the low prevalence of chronic disease in those countries (Psaltopoulou et al., 2004). Also, an estimate of dietary fat intake has demonstrated that the consumption of unhealthy dietary fat, such as trans-fatty acids differs considerably in various countries throughout the world; Mediterranean countries show the lowest intake of trans-fatty acids. There is considerable evidence to suggest that the Mediterranean diet is associated with a decreased prevalence of cardiovascular disease and certain cancer types, despite the fact that this diet is higher in fat than the typical Western diet. An important component of the Mediterranean diet, and a possible reason for this disease prevalence difference, may be the source of fat, which is primarily from olive oil. The high level of oleic acid is believed to contribute to the low incidence

of chronic disease (Psaltopoulou et al., 2004). Studies comparing different levels of olive oil consumption have provided evidence that
olive oil may have health benefits, which include a reduction in high blood pressure and lower risk of breast and colon cancers (Psaltopoulou et al., 2004

METHODS

The purpose of the study was to assess the intake and knowledge of olive oil and other lipids in a collegiate population. To achieve this goal, a questionnaire was developed that assessed student knowledge and dietary behavior related to fat consumption. The questionnaire and the description protocol were submitted to the Georgia State University. The divisions included were Nurses (NURS), Students (S), and other (OTH).
An SPSS database file was created to include each of the variables in the questionnaire. Data were analyzed using SPSS v16.0. Descriptive statistics were determined for all participants, including frequencies, means, medians and standard deviation grouped students by age, gender to determine differences in both lipid consumption behavior and lipid knowledge.

RESULTS AND DISCUSSION

There were a total of 50 subjects volunteered for the study. Of these 24 are students, nurses are 12 (24%) and other professions are 14 (28%).19 of participants were male (M) and 31 (62%) were female (F). The average age of the total subject population was 30.22 years (SD=13.5). The oldest subject was 63 years and the youngest was 19 years. There were a total of 26 graduate (GRAD) subjects and 24 undergraduate (UND) subjects.

Table nr. 1 Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
gender	50	1	2	1.38	.490
age	50	19	63	30.22	13.530
Grad/ ungrad	50	1	3	1.80	.857
Valid N (listwise)	50				

Table nr.2 Gender of subject

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	female	31	62.0	62.0	62.0
	male	19	38.0	38.0	100.0
	Total	50	100.0	100.0	

Table nr.3 Graduation of subject

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	student	24	48.0	48.0	48.0
	nurse	12	24.0	24.0	72.0
	other	14	28.0	28.0	100.0

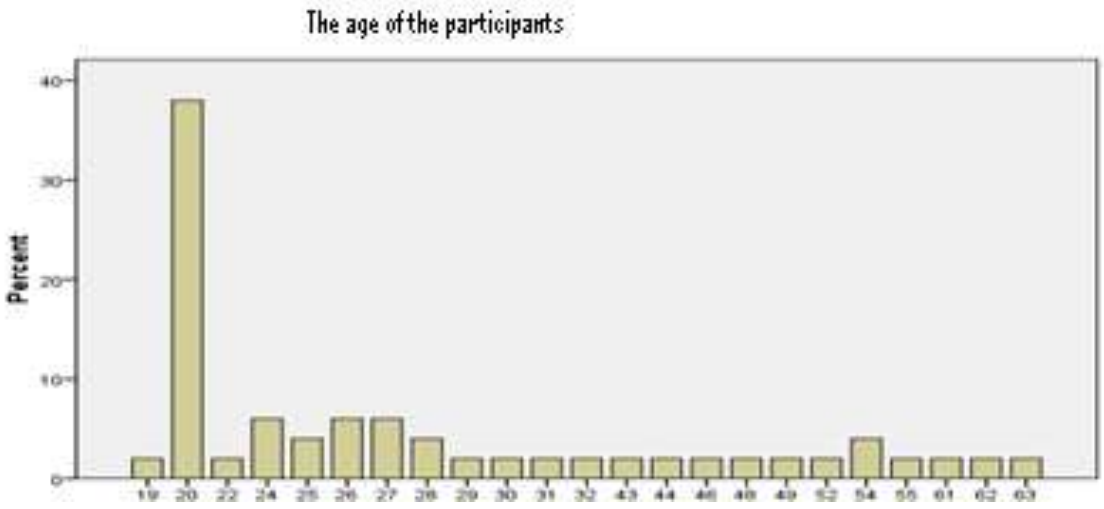

Figure 1:The age of the participants

Lipid Eating Behaviors of the Assessed Population

To assess the issue of lipid consumption behaviors in a population, subjects (N=50) responded to a questionnaire containing a series of questions on lipid consumption frequencies. The Likert scale used to determine consumption frequency was: 1= not at all; 2= occasionally; 3= somewhat; 4=often; 5= only oil used and 6= I don't know. What follows is an analysis of means and frequencies of responses by the total subject group

Table nr.4 Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
How much do you like olive oil	50	1	5	4.20	1.325
How much do you like sunflower oil	50	1	5	2.34	1.118
How much do you like margarine	50	1	5	1.78	1.036
How much do you like butter	50	1	5	2.62	1.123
How much do you like corn oil	50	1	5	1.92	1.066
How much do you like peanut oil	50	1	4	1.50	.814
How much do you like vegetable oil	50	1	5	1.72	1.070
How much do you like soybean oil	50	1	4	1.56	.907

Table nr.6 : How much do you like olive oil

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.Not at all	5	10.0	10.0	10.0
	2.occasionally	1	2.0	2.0	12.0
	3.somewhat	6	12.0	12.0	24.0
	4.often	5	10.0	10.0	34.0
	5.only oil used	33	66.0	66.0	100.0
	Total	50	100.0	100.0	

Table nr 5 How much do you like sunflower oil

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.Not at all	14	28.0	28.0	28.0
	2.occasionally	15	30.0	30.0	58.0
	3.somewhat	12	24.0	24.0	82.0
	4.often	8	16.0	16.0	98.0
	5.only oil used	1	2.0	2.0	100.0
	Total	50	100.0	100.0	

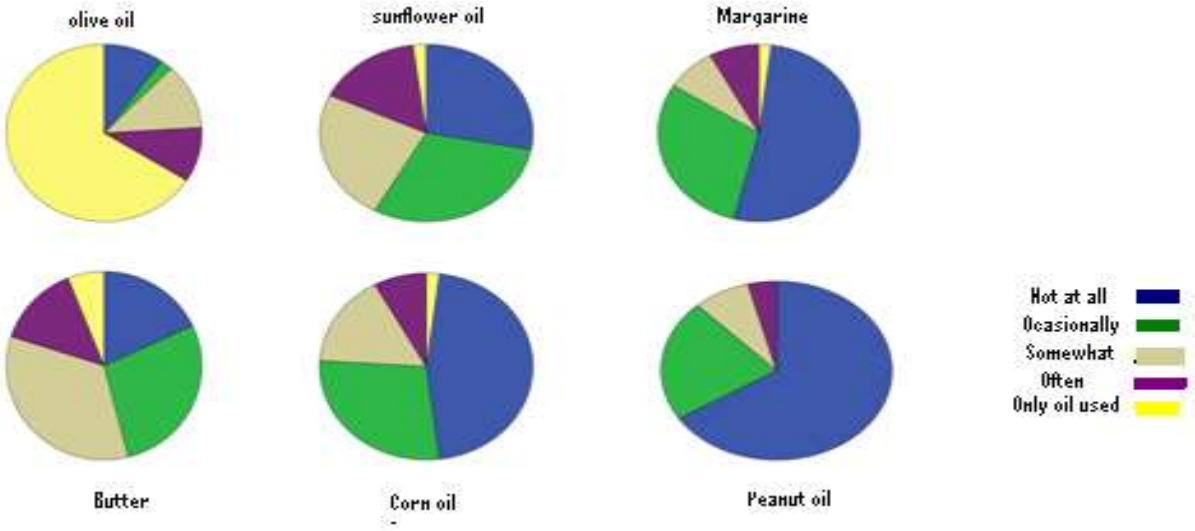

Figure nr 2 :It is presented the pies of some lipids about how much the participants like lipids

Table nr.7 How much do you like margarine

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.Not at all	26	52.0	52.0	52.0
	2.occasionally	15	30.0	30.0	82.0
	3.somewhat	4	8.0	8.0	90.0
	4.often	4	8.0	8.0	98.0
	5.only oil used	1	2.0	2.0	100.0
	Total	50	100.0	100.0	

Table nr.8 How much do you like butter

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.Not at all	9	18.0	18.0	18.0
	2.occasionally	14	28.0	28.0	46.0
	3.somewhat	17	34.0	34.0	80.0
	4.often	7	14.0	14.0	94.0
	5.only oil used	3	6.0	6.0	100.0
	Total	50	100.0	100.0	

Table nr.9 How much do you like peanut oil

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.Not at all	33	66.0	66.0	66.0
	2.occasionally	11	22.0	22.0	88.0
	3.somewhat	4	8.0	8.0	96.0
	4.often	2	4.0	4.0	100.0
	Total	50	100.0	100.0	

Table nr. 10 How much do you like corn oil

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.Not at all	23	46.0	46.0	46.0
	2.occasionally	14	28.0	28.0	74.0
	3.somewhat	8	16.0	16.0	90.0
	4.often	4	8.0	8.0	98.0
	5.only oil used	1	2.0	2.0	100.0
	Total	50	100.0	100.0	

Table nr.11 How much do you like soybean oil

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1.Not at all	33	66.0	66.0	66.0
	2.occasionally	9	18.0	18.0	84.0
	3.somewhat	5	10.0	10.0	94.0
	4.often	3	6.0	6.0	100.0
	Total	50	100.0	100.0	

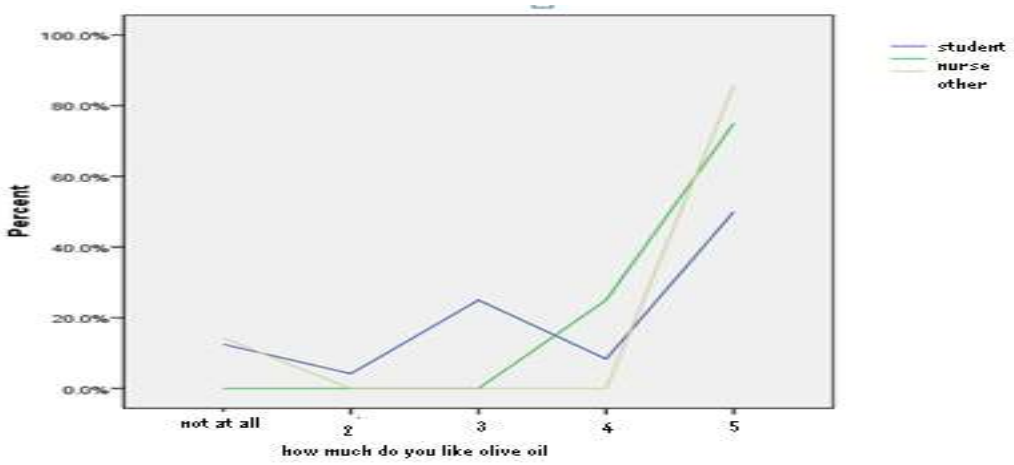

Figure 3:How much the three groups of participants like olive oil.

Lipids Knowledge of the Assessed Population

To assess this issue, subjects (N=50) responded to a questionnaire containing a series of questions on lipid knowledge. The possible answers, either correct or incorrect for each of the lipid were; 1= saturated fat, 2= MUFA, 3= PUFA ,4= polyphenols, and 5= I don't know. What follows is an analysis of percentage of responses by subgroup (graduate, undergraduate,).
Of total (N=50), over 30% of nurses indicated they did not know what olive oil contained, while 20% responded incorrectly on the contents of olive oil. Only a small proportion of the total population (5%) responded correctly by stating that olive oil contained polyphenols and MUFA. 46% of nurses indicated that olive oil contained either PUFA or saturated fat (incorrect responses). The group of students (45%) indicated that olive oil contained PUFA and 48% of them responded I don't know.

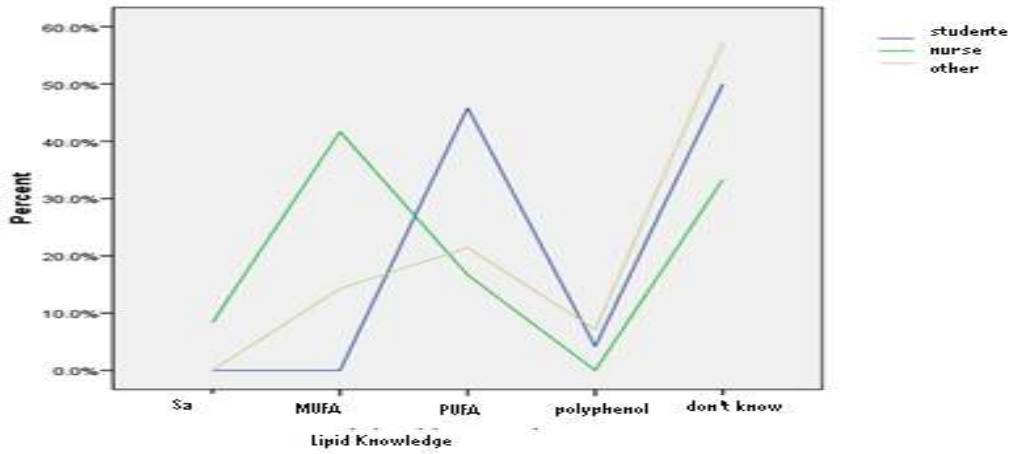

Figure 4: Lipids Knowledge of three groups of participants about olive oil.

CONCLUSIONS

This study focused on a group of students of Faculty of Medicine. One might assume that such a population would be sensitive and knowledgeable about key dietary factors that may influence disease risk. Nevertheless, these findings indicate that, except for isolated exceptions, the eating behaviors and lipid knowledge of these students is not at a level that could be considered health promoting. This suggests that, even with students in the health and medicine sciences, personal health classes are likely to be beneficial in reducing disease prevalence. It is necessary to promote knowledge of basic products to different persons of different levels of graduation,that are so important in reducing disease risk.
On the other hand most of the participants use and like very much olive oil that is important.

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