

Original article

Dietary habits in Greek middle school students according to gender

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SUMMARY

The dietary habits of 374 healthy Greek students aged between 12 and 15 years were investigated. **Subjects and Methods:** There were 185 male and 189 female students (6th Gymnasium of Nicea), of mean age 13.5 and 13.6 years respectively, residents of an area of approximately 150,000 inhabitants of low to moderate socioeconomic level. Dietary habits were evaluated using a specially formulated questionnaire, which included various items referring to dietetic habits, as well as questions related to educational and social status of the students' family. Body Mass Index was also calculated for each subject. **Results:** The results showed that milk was the main constituent of the breakfast in 228 students (60.3%). Sugar was added in the milk by only 17% of cases. Four percent of the students consume fruit during the breaks and 55% eat mainly cheese. Fifty-six percent consume fruit or fruit juices during the day. Only 5.8% of them eat bread rich in fiber. Eighty three per cent of the total population of students eats one or more kinds of pulses, at least once a week, while the corresponding figures for meat and fish were 84.1% and 73.6% respectively. Most of the students very often eat different kinds of candies. Consumption of different kinds of beverages or refreshments (including various cola liquids) was reported by 27.5% of them. Male students described meat consumption less frequently than female students ($P < 0.002$). The majority

of students (58.2%) have their meals prepared by their parents and most of them (68%) were informed about the various aspects of the so-called "healthy diet" by their parents and/or teachers. Significant differences in the proportion of female students being above or under normal Body Mass Index limit were found ($P = 0.007$). **Conclusion:** It is concluded that the dietetic habits of students in this particular area of Greece include some elements of the traditional Mediterranean diet. Generally there were no significant differences between boys and girls as far as the kinds of food consumption were concerned.

Key words: Mediterranean diet, Diet, Greece, Students, Dietary habits

INTRODUCTION

In previous decades, the Greek diet was characterized by low consumption of saturated and high consumption of unsaturated fat derived mainly from olive oil, high consumption of complex carbohydrates derived mainly from grains and fruits, and high consumption of fiber derived mostly from vegetables and fruits.¹⁻⁴ This diet is considered to be responsible for the long life expectancy observed in the Greek population. However, after the second world-war considerable changes in the traditional Greek (Mediterranean) diet were noticed. These changes were mainly related to increased consumption of refined sugar and meat and decreased consumption of the above mentioned "healthy diet".⁵⁻⁸ All studies performed so far in subjects of Greek origin refer to healthy or diseased adult population and not to subjects of school age.

The aim of this study was to examine the dietary habits of healthy Greek students aged 12 to 15, and to see if

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there were differences in the dietary habits between boys and girls.

SUBJECTS AND METHODS

A total number of 374 healthy students (students of the 6th Gymnasium of Nicea, Pireaus, Greece) were studied. There were 185 male and 189 female of mean age 13.5 and 13.6 years respectively (range 12 to 15). The students were residents of an area with a total population of approximately 150,000 inhabitants of low to moderate socioeconomic level. Dietary habits were investigated using a specially formulated questionnaire, which included 18 different questions related to the number and consistency of meals, and questions related to daily, weekly, or monthly consumption of different foods such as refined sugar and sugar products, meat, bread and fiber. Ethanol, an important element of the traditional Mediterranean diet^{4,5} was not included in the questionnaire, because all students denied consumption of beverages containing alcohol. There were also questions related to educational and social level of each subject's family. Body Mass Index was separately calculated for each individual.

Subjects were classified according to their age in three categories: i) below normal body weight, ii) normal weight and iii) above the normal weight. For the classification of each student's BMI we used data derived from the National Center for Health Statistics of DHEW in the USA, as relevant statistics in Greece are lacking.

In order to compare differences in the proportion of consumption of different kinds of food between male and female students chi squared statistic was used. Statistical significance was set at 5% level.

RESULTS

Table 1 shows the incidence of consumption of fiber in the form of vegetables, fresh fruits, fruit juice, and pulses, while tables 2 to 4 show the incidence of consumption of meat, fish, and sugar respectively in the total number of subjects and separately for boys and girls. A significant number of students (28.3%) do not eat vegetables, although most of them (92%) drink fresh fruit juice or fresh fruit. Eighty-three percent of them eat pulses at least once a week. Thirty-seven percent eat meat at least every other day and almost 48% eat fish once a week. Sugar and/or other types of candies are consumed every day by 20.1% and quite often by 49% of them.

Differences between male and female students were

found to be significant only in the consumption of meat. It was found that male students described meat consumption less frequently than female students ($P < 0.002$) (Table 2).

Table 5 shows the type of oil regularly used in every day cooking in the whole group of subjects and separately for male and female. Olive oil was used by the majority of them (80%) in every day cooking.

Other findings related to the incidence of food consumption were: a) most of the students (60.3%) drink milk every morning mainly in the form of chocolate milk (48.7%). Only a minority of them (4%) prefer to eat fruit in the breaks between the lessons. Only a small proportion (5.8%) eats bread made from whole grain. Finally, only half of them eat at regular hours, each day.

Table 6 shows the source of information regarding the so called "healthy diet". As it is obvious the main source of information related to the benefits of "healthy" diet was the parents of students, followed by a special lesson ("house economy") delivered in the school. No significant differences between male and females were found.

Table 7 shows the Body Mass Index in the male students according to the age. No significant differences in the proportion of male students being above and under normal limit were noticed. However, there was a trend for male students to become overweight as the age increases.

Table 8 shows BMI values in the female students according to the age. Significant differences in the proportion of female students being above or under normal limit were found ($P = 0.007$). It is of interest that as the age increases the proportion of female students having normal body weight increases.

Almost half of male students had BMI above the normal limit (45.5%), while the corresponding figure for female students was 21.5%.

DISCUSSION

The results of the present study showed that almost one third of Greek adolescent students do not eat vegetables, although most of them eat fresh fruit or drink fresh fruit juice. Eighty-three of them consume pulses at least once a week. On the other hand, 37% of them eat meat at least every-other day, and almost 50% of them eat fish once per week. Sugar and other types of candies, are consumed quite often (49%). Most of the students

Table 1. Incidence of fiber consumption (*vegetables, fruits and pulses*)

Incidence	Male	Female
Vegetables		
Every day	56 (30.3%)	46 (24.3%)
Often	75 (40.5%)	93 (49.2%)
Rarely or never	54 (29.2%)	50 (26.4%)
<i>P-value: 0.221 (NS)</i>		
Fresh fruits &/or fruit juice		
Every day	107 (57.8%)	103 (54.5%)
Often	66 (35.7%)	68 (36.0%)
Rarely or never	12 (5.9%)	18 (9.5%)
<i>P-value: 0.532 (NS)</i>		
Pulses		
Every day	155 (83.8%)	156 (82.5%)
Often	26 (14.1%)	28 (14.8%)
Rarely or never	4 (2.2%)	5 (2.6%)
<i>P-value: 0.930 (NS)</i>		

Table 2. Incidence of *meat* consumption

Incidence	Male	Female
Every day	13 (6.5%)	2 (1.6%)
Twice per week	55 (29.2%)	86 (45.0%)
Four times a week	94 (50.3%)	83 (43.9%)
Once a week	13 (6.5%)	8 (4.2%)
Rarely or never	10 (5.9%)	10 (5.3%)
<i>P-value: 0.002 (SS)</i>		

Table 3. Incidence of *fish* consumption

Incidence	Male	Female
Once or twice a week	139 (75.1%)	136 (71.9%)
Rarely or never	46 (24.8%)	53 (28.1%)
<i>P-value: 0.562 (NS)</i>		

Table 4. Incidence of *sugar or candies* consumption

Incidence	Male	Female
Every day	31 (16.8%)	45 (23.8%)
Often	94 (50.0%)	92 (48.0%)
Rarely	59 (31.9%)	53 (27.0%)
<i>P-value: 0.237 (NS)</i>		

Table 5. *Type of oil* used in every *day's* cooking

Incidence	Male	Female
Olive oil	144 (80.4%)	158 (84.9%)
Butter	25 (14.0%)	18 (9.7%)
Seed oil	10 (5.6%)	10 (5.4%)
<i>P-value: 0.437 (NS)</i>		

Table 6. Sources of information regarding the so called "healthy diet"

Source	Male	Female
Parents	125 (67.6%)	129 (68.6%)
Friends	3 (1.6%)	3 (1.1%)
Newspapers/TV	10 (5.4%)	8 (4.3%)
Relevant lessons in school	43 (23.2%)	43 (22.9%)
None	4 (2.2%)	5 (2.1%)

*P-value: 0.985 (NS)***Table 7.** Body Mass Index in the male students according to their age

Age (years)	Under	Normal	Above
12	0(0%)	6(54.4%)	5(45.5%)
13	7(9.3%)	36(48.0%)	32(42.6%)
14	3(5.1%)	28(48.2%)	27(46.5%)
15+16	6(20.8%)	9(29.1%)	15(50.0%)

*P-value: 0.412 (NS)***Table 8.** Body Mass Index in the female students according to their age

Age (years)	Under	Normal	Above
12	1(4.7%)	13(61.9%)	7(33.3%)
13	3(4.3%)	46(65.7%)	21(30.0%)
14	7(11.1%)	49(77.7%)	7(11.1%)
15+16	2(4.2%)	22(83.3%)	6(12.5%)

P-value: 0.007 (SS)

(60.3%) drink milk every morning mainly in the form of chocolate milk (48.7%). Only 4% of them prefer to eat fruit in the breaks between the lessons. Only a small proportion (5.8%) of them, eat bread made from whole grain. Finally, only half of them eat at regular hours, each day.

These data have some differences compared to other published data. For example in Syria, more than 50% of the students said that they did not consume green vegetables and more than 35% did not consume meat. More than 35% said that they consumed cheese and milk at least once a day. Only 11.8% consumed fruit 3 times or more daily.⁹ In a relevant study performed in Croatia,¹⁰ it was found that the most common choice for snacks was fruit. On the other hand, red meat, cereals and fast food were consumed more often by males, while low-fat dairy products, whole grain products and breakfast cereals were consumed more often by females. These results differ from those found in our study as the only difference in the food consumption between male and female

students was meat consumption. It has been suggested that perceived parent modelling, perceived parent support, self-efficacy, and perceived fruit and vegetable availability were significant predictors of fruit and vegetable consumption. However, parents appear to moderately influence middle school student fruit and vegetable consumption.¹¹ Educators might focus on improving home fruit and vegetable availability and student self-efficacy.

Olive oil was used by the majority of parents of students in every day cooking. We were not able to find relevant information in the literature. The consumption of oil in a significant proportion of students of our study - a main constituent of the Mediterranean diet - indicates that some elements of the Mediterranean diet are still part of the Greek diet.

Concerning the information related to the benefits of "healthy" diet we found that the parents of students and a special lesson ("house economy") delivered in the school, were the main sources of information. In a relevant study it was described that knowledge of healthy diets among school students was inadequate.¹² Adequate information about healthy eating habits and lifestyle must be included in school curricula.¹³ It has been suggested that family meals appear to play an important role in promoting positive dietary intake among adolescents.¹⁴

Concerning the Body Mass Index we found that almost half of male students had BMI above the normal limit (45.5%), while the corresponding figure for female students was 21.5%. No significant differences in the proportion of male students being above and under normal limit, although there was a trend for male students to become overweight as the age increases. On the contrary, we found significant differences in the proportion of female students being above or under the normal limit. It was noticed that as the age increases the proportion of female students having normal body weight increases.

Low socioeconomic status is a risk factor for obesity.¹⁵ It is well known that increases in childhood overweight and obesity have become an important public health problem in industrialized nations. Parents and schools provide important opportunities for public health initiatives for reducing childhood overweight and obesity. Children and schools in low-income neighbourhoods should receive priority in public health initiatives to reduce future socioeconomic inequalities in health.¹⁶ In another study,¹⁷ it was found that for reasons probably related to body image, female students had healthier habits related to nutrition. Male students showed a high

level of overweight and obesity and were less interested in nutrition advice and health enhancing activities.

In conclusion, although eating habits of Greek school-aged adolescents are in the process of changing from more traditional to more Westernized ones,¹⁸ there are still elements of Mediterranean diet such as olive oil, pulse consumption, and regular fish and milk consumption. Because meal patterns with omission of breakfast or breakfast and lunch was related to a clustering of less healthy lifestyle factors and food choice leading to a poorer nutrient intake,¹⁹ patients and teachers could be the most important persons involved in the education of students, concerning healthy diet. However, school nurses could play a vital role in planning policies at the local and national level that support and encourage healthy food environments.²⁰ The adoption of the latter by the Greek authorities could positively influence the eating behaviour of our students.

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