Research Paper

Dietary habits of Greek teenagers between the age of 13 - 15

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ABSTRACT: *The course of Technology is taught in 7th, 8th, and 9th grade. In the 9th grade the study program is structured in a way that offers the chance to conduct experiential research with the final target being the understanding by the students of the methods that are used during research by the students. The aim of this work was to investigate the dietary habits of teenagers between the age of 13 and 15 as well as their perception and general view regarding nutrition. An additional target of the research was the introduction of the students to the procedure of experiential research. The research included 920 male and female high school students from the northern part of Greece (Macedonia, Thrace). The survey questionnaire was constructed by the students during the course of Technology and consisted of 2 parts. The first part included 6 questions regarding the demographic characteristics and the second part included 18 questions regarding the eating habits of the students. The statistical analysis of the data included elements of descriptive statistics. The interviews were analyzed by the use of the qualitative research method of data analysis. To sum up the results of the research, the dietary habits of students between the age of 13 and 15 are far from ideal and their nutrition can put them in danger once they get to an older age.*
KEYWORDS: Health, Mediterranean Dietary, Teaching Methods, Statistics, Questionnaire

I. INTRODUCTION

One of the main characteristics of teenage years is fast physical growth. Consequently, healthy dietary habits that can affect body development in a positive should be essential for every teenager. This position is strengthened by the fact that the early ages in the life of a human being are proved to be the period that the permanent eating patterns are determined. Additionally, during the teenage years, the consequences of unhealthy eating are starting to appear [1].

The dietary habits that people develop as teenagers are strongly dependent on the eating patterns that their whole family follows as well as their friends [2]. The nutrition during puberty must be complete and able to support the activities of the person. Furthermore, during this crucial period, all the internal organs are taking their final biological form, a process that becomes more difficult and stressful due to the demanding school program and all the extracurricular activities [3].

For a person to have proper physical development it is essential to have balanced nutrition, which will provide all the micronutrients required. An adequate diet will help the person stay healthy and function properly. On the other hand, obesity that is one of the biggest problems during puberty for many people is the increase of fat cells, it usually starts to occur during the teenage years, but it can remain throughout adulthood and be difficult to get rid of [4].

During the teenage years, it is especially important to consume lots of foods that contain antioxidants and vitamins as well as foods that are rich in fiber. Additionally, the low consumption of saturated fats has been associated with breast cancer [5] & [6]. Furthermore, puberty is a crucial period during a person's life due to the reason that bone density and bone mass are mostly developed during that time. Consequently, the daily intake of

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calcium should be approximately near 1300 mg, which translates into 4 glasses of milk or an equivalent portion of another dairy product.

The increase in blood volume in both sexes, as well as the beginning of the period in girls and the fast muscle growth in boys, are things that start to occur during puberty and increase the needed iron intake. The recommended daily iron intake is 18mg for girls and 12 mg for boys. Even though iron can be found in many vegetables like lentils, spinach and chards the absorption is very low (10.5%). Due to that, it is recommended to both males and females to include meat and fish into their diets since they are absorbed better (25%). The proper intake of vitamin C is also recommended because it increases iron absorption.

The importance of a healthy and balanced diet has been proven repeatedly but teenagers continue to not follow healthy dietary habits. They are used to skip breakfast and they consume products of low nutritional value (snacks, soft drinks, etc.). These food sources contain high amounts of sodium and saturated fats, due to that, are best to be consumed as little as possible. Additionally, most teenagers follow a diet that lacks adequate amounts of iron, calcium, and fiber whilst many girls try to diet down dangerously, and boys often use dietary supplements.

To prevent the worse and to help teenagers, the Greek Association of Nutritionists published a paper with some basic advice and recommendations for a healthy diet. These recommendations were: a) do not skip any of the main meals (breakfast, lunch, dinner), b) the breakfast should never be neglected since it is the most important meal of the day, c) the consumption of fast food should be avoided d) avoid the consumption of large quantities of fat and sugar, e) increase the consumption of foods rich in fiber and antioxidants like vegetables and fruits, f) have a wide variety of food sources and try to maintain a healthy body weight, g) avoid the consumption of alcohol whilst trying to drink more water, h) avoid the large consumption of candy, soft drinks, and sodium, i) participate in sports activities and try to exercise more.

The purpose of the research was to investigate the dietary habits of teenagers between the age of 13 and 15 as well as their views and stance on nutrition in general. An additional target of the research was the introduction of students on how experiential research is organized and conducted.

II. METHOD

Participants

The research included 920 male and female high school students from the northern part of Greece (Macedonia, Thrace). The participants were randomly selected. In the final research participated only 888 of the starting 920 since 32 of the surveys were incomplete. The demographic characteristics of the participants are shown in Table 1.

Table 1: Demographic characteristics of participants by gender & age

Age		Gender			Total	
		Male		Female		
13	175	19.71%	145	16.33%	320	36.04%
14	170	19.14%	126	14.19%	296	33.33%
15	155	17.45%	117	13.18%	272	30.63%
Total	500	56.30%	388	43.70%	888	100%

Concluding the results that are displayed in Table 2, we can highlight that the majority of the students do not exercise consistently since 72.30% stated that they do not take part in organized physical activities.

Table 2: Consistent participation in sports

Are you consistently taking part in sports activities?	Male		Female		Total	
Yes	156	17.56%	90	10.14%	246	27.70%
No	344	38.74%	298	33.56%	642	72.30%
Total	500	56.30%	388	43.70%	888	100%

Procedure / Instrument

The course of Technology is taught in 7th, 8th and 9th grade. In the 9th grade the study program is structured in a way that offers the chance to conduct experiential research with the final target being the understanding by the students of the methods that are used during research by the students. Additionally, within the goals of the research is the comprehension of certain terms by students, such as "types of research" and "construction of a questionnaire survey". Other terms that the students had the chance to familiarize themselves with are "research sample" and "statistical analysis". During the conduction of the research, a literature review was written in Greek as well as in English and German language. The keywords of the research were

"nutrition", "healthy eating", "diet", "fats", "carbohydrates", "ideal weight" and "alcohol". Whilst the notions that would set to be investigated during the research was determined by the interviews with the students (8 males and 7 females).

The survey questionnaire was constructed by the students during the course of Technology and consisted of 2 parts. The first part included 6 questions regarding the demographic characteristics of the sample like gender, age, teaching grade, participation in sports, weight, and height. The weight and the height measurements were important in order to calculate BMI (Body Mass Index) (weight/height^2) [7]. The second part included 18 questions regarding the eating habits of the students like whether or not they eat breakfast, consume alcohol, and which days they consume meat and legumes.

StatisticalAnalyses

The statistical analysis of the data included elements of descriptive statistics. The interviews were analyzed by the use of the qualitative research method of data analysis.

III. RESULTS

Body characteristics and measurements (body mass index)

The BMI was calculated from the weight and height of the students. After the BMI calculation of each student, each one of them was categorized in one of the three different weight categories: Normal Weight, Underweight, Overweight, and Obesity. The results that are displayed in Table 3 show that 8.33% of the students are in the Underweight category, 22.30% are in the Overweight category, 6.42% are obese and the majority of the students are in the Normal Weight category.

Table 3. Students' distribution by Body Mass Index

Class	Normal weight		Underweight		Overweight		Obesity		
	Male	Female	Male	Female	Male	Female	Male	Female	Total
7th	125	99	4	5	38	33	8	8	320
8th	130	48	6	32	22	42	12	4	296
9th	96	61	15	12	28	35	16	9	272
Total	351	208	25	49	88	110	36	21	888

Eating habits

After taking into consideration the information in Table 4 we can conclude that the majority of the students do not start their day in the right way since 21.63% do not eat breakfast while 33.78% eat only sometimes. Only 44.59% of the students eat breakfast consistently on a daily basis. Regarding sex, only 7.21% of the females eat breakfast every day while 13.97% of them either eat rarely or never at all.

Table 4. Are you having breakfast?

Are you having breakfast?	Male		Female		Total	
Every day	332	37.38%	64	7.21%	396	44.59%
Sometimes	100	11.26%	200	22.52%	300	33.78%
Rare	48	5.41%	64	7.21%	112	12.62%
Never	20	2.25%	60	6.76%	80	9.01%
Total	500	56.30%	388	43.70%	888	100%

From the students that stated they are eating breakfast on a daily basis (396), 332 of them also stated that their breakfast consists of foods like milk, cereals, honey and butter, bread and cheese, cakes, and brioche. The bad eating habits especially of the female students are shown again to be not ideal since 150 of them stated that their breakfast consists only of a glass of fruit juice.

Table 5. Breakfast

	Male		Female		Total	
Milk	40	4.50%	24	2.70%	64	7.20%
Cereals	75	8.46%	39	4.39%	114	12.85%
Fruit juice	48	5.41%	150	16.89%	198	22.30%
Honey /marmalade/ butter	25	2.82%	20	2.25%	45	5.07%
Bread/ toast / Cheese	20	2.25%	20	2.25%	40	4.50%
Cakes, brioche	--		15	1.69%	15	1.69%
Variety from above	272	30.63%	60	6.76%	332	37.39%

An important number of students (385, 43.36%) consume fast food on a daily basis while male students are a big percentage of that number.

Table 6. How many times per week do you eat fast food?

	Male		Female		Total	
1-2	55	6.19%	46	5.18%	101	11.37%
3-4	75	8.45%	59	6.64%	134	15.09%
Every day	280	31.53%	105	11.82%	385	43.36%
Never	90	10.14%	178	20.06%	268	30.18%

During the break time, half of the students eat something that is bought from the school canteen, while the other half eat something that they have prepared at home.

Table 7. What do you usually eat during breaks?

	Male		Female		Total	
Snacks, sandwiches	12	1.35%	--		12	1.35%
Something I prepared at home	210	23.65%	130	14.65%	340	38.29%
I am buying something from the school canteen	262	29.50%	178	20.06%	440	49.55%
I do not eat anything	16	1.80%	80	9.01%	96	10.81%

The consumption of fish, legumes, vegetables, and dairy products is considered sufficient since they are shown to be within the standards that are set by the Mediterranean diet. The only measure that exceeds the acceptable rates is the consumption of meat, which is consumed by the majority of the students (392) on a daily basis.

Table 8. Weekly consumption of meat, fish, legumes, vegetables, and lactate

	Meat		Fish		Legumes		Vegetables		Lactate	
1-2 per weeks	482	54.28%	580	65.32%	276	31.08%	---		85	9.57%
3-4 per weeks	308	34.68%	52	5.86%	464	52.25%	488	54.95%	255	28.72%
Every day	74	8.33%	--		148	16.67%	400	45.05%	540	60.81%
Never (we cannot buy)	16	1.80%	16	1.80%	---		---			
Never (I am vegetarian)	8	0.90%	8	0.90%	---		---		8	0.90%
We do not like fish	---		232	26.13%	---		---		---	

Table 9. For dinner, you eat

	Male		Female		Total	
Cereals	40	4.50%	75	8.45%	115	12.95%
Salad	25	2.82%	30	3.38%	55	6.19%
Red meat	155	17.46%	35	3.94%	190	21.40%
Chicken	63	7.09%	--		63	7.09%
Vegetables	67	7.55%	47	5.29%	114	12.84%
Yogurt	35	3.94%	65	7.32%	100	11.26%
Pizza,	70	7.88%	48	5.41%	118	13.29%
I never eat at night	45	5.07%	88	9.91%	133	14.98%

The bad dietary habits of the students can be noticed in the results that are displayed in Table 10. Only 128 students avoid the consumption of any kind of candy while 158 students stated that they consume some kind of candy almost every day. Similar are the results regarding the consumption of soft drinks since over half of the students consume at least 1-3 soft drinks per week.

Table 10. Weekly consumption of soft drinks and candy

	Sweets				Soft drink			
	Male		Female		Male		Female	
1-3	375	42.33%	100	11.26%	65	7.32%	125	14.08%
4-5	17	1.91%	110	12.39%	145	16.33%	93	10.47%
Every day	80	9.01%	78	8.78%	40	4.50%	20	2.25%
I do not eat sweets	28	3.15%	100	11.26%	---		---	
I do not drink	---		---		250	28.15%	150	16.89%

From the results that are demonstrated in Table 11 is concluded that 60 students are consuming alcohol every day and all of them are attending the 9ᵗʰGrade. Additionally, 300 students are consuming alcohol on special occasions. It is worth mentioning that the parents of the students were aware of that fact.

Table 11. Weekly consumption of alcohol

	Male		Female	
Yes, every day	45	5.07%	15	1.69%
Yes, in some special moments	225	25.34%	75	8.45%
Rare	80	9.01%	78	8.78%
I do not drink alcohol	150	16.89%	220	24.77%

IV. DISCUSSION

The course of Technology is taught in 7ᵗʰ, 8ᵗʰ, and 9ᵗʰ grade. In the 9ᵗʰ grade the study program is structured in a way that offers the chance to conduct experiential research. One of the main goals of the research was the comprehension by the students of the methods being used during research. It is without a doubt one of the most important periods in a person's life regarding the development of the human mind and body is the teenage years. Consequently, another purpose of the research was the investigation of the dietary habits of teenagers between the age of 13 and 15, as well as their thoughts regarding nutrition and its importance in a human's health.

To the research took part a total of 888 students from junior high schools from the region of Northern Greece. The majority (56.03%) of them were male students whilst not a small percentage (43.7%) either was female students. From the total of 43.7% of female students, only 27.7% stated that they took part consistently in organized sports activities. The results of the research come in contrast with the recommendations of the [8], which recommend participation in sports activities on a consistent basis in order to prevent obesity and other health problems. In contradiction to that, they come in agreement with the findings of other researches [9]; [10]. Other researches [11] & [12] have proven that systematic participation in physical activities can prevent cardiovascular diseases, diabetes, stroke, and many forms of cancer.

The consequences of the lack of exercise are shown in the body mass index. According to the results, 1/3 of the students are overweight whilst a smaller percentage is underweight. The results of the research come in agreement with the findings of other researches, according to which an increase in obesity can be noticed not just in Greece but all over the world [13]; [14]; [15] & [16].

The findings of the research regarding the diet of students show us that there are major issues especially during the breakfast portion of it. Near to 200 students are not taking breakfast at all, whilst an additional 300 students take breakfast only sometimes. Additionally, from the female students that stated they are taking breakfast, 150 of them usually drink just a glass of fruit juice. Continuingly an impressive 268 students (30.18%) stated that their diet consistently includes fast food. The situation gets slightly better later in the day since most of the students follow a Mediterranean Diet for the most part. Nevertheless, 74 students stated that they eat meat every day whilst 308 consume meat 3-4 times per week. In contradiction to that, 16 students do not eat meat at all due to the fact that their parents cannot afford it.

Another fact that proves the bad dietary habits of students is that 133 of the students that participated in the research do not eat anything at nighttime while 122 of those is the second meal that is nonexistent since they do not eat breakfast as well. Only 128 students do not consume any kind of candy and 440 students avoid soft drinks. The most worrying single piece of information is the number of students that consume alcohol.

V. CONCLUSION

All the above might reflect the reasons that obesity can be observed around us ever more significantly than before. To sum up the results of the research, the dietary habits of students between the age of 13 and 15 are far from ideal and their nutrition can put them in danger once they get to an older age.

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