



# Determination of Adaptation to the Mediterranean Diet of Individuals Living in the Turkish Republic of Northern Cyprus

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## Abstract

This study aims to determine the adaptation level of the individuals living in The Turkish Republic of Northern Cyprus (TRNC) to the Mediterranean diet and revealing the factors affecting the adaptation to the diet. Mediterranean diet is a dietary habit observed in Southern Italy, some regions in Greece and the Mediterranean islands where olive is planted traditional Mediterranean basin diets contain fresh and natural food, vegetable, fruit, grains, bread, fish, olive oil, nuts such as walnut, peanut, hazelnut, wine in moderate dose, low level of milk and meat products, and poultry animals. For this purpose, 422 participants between 18 to 65 years of age living in the TRNC were surveyed. The data collection tool contains General Information Form, Nutritional Habits Form, Food Consumption Frequency Form, and Mediterranean Diet Quality Index Form. 54% were women. 51.2% of the sample is average weight, 38.4% is overweight, and 10.4% is obese.

In the evaluation of Mediterranean diet quality, 57.1% of the participants were found to have an optimal diet, 31.3% of the participants had required intervention in their diet, and 11.6% of the participants had a very low-quality index. The quality of the Mediterranean diet differentiates on gender, age, body mass index ( $p < 0.05$ ). The average of normal weighted participants is significantly higher than overweighted and obese participants. The quality of the Mediterranean diet differentiates by the change occurred in the body within the last 6 months, cohabitants and vitamin-mineral tablet usage within the last 12 months ( $p < 0.05$ ). When the findings of the study are evaluated in general, there is evidence that individuals living in the Turkish Republic of Northern adhere to the Mediterranean diet.

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Received Date: 17 Jun 2020

Accepted Date: 03 Jul 2020

Published Date: 07 Jul 2020

### Citation:

Hulya Demir, Aslihan Soyal .

Determination of Adaptation to the Mediterranean Diet of Individuals Living in the Turkish Republic of Northern Cyprus. *Ann Nutr Food Sci*. 2020; 4(1): 1042.

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**Keywords:** Food variety; Mediterranean diet; Diet quality

## Introduction

Mediterranean diet is a dietary habit observed in Southern Italy, some regions in Greece and the Mediterranean islands where olive is planted [1]. Defined by Angel Keys for the first time, the fundamental property of the Mediterranean diet is the variety of food [2]. Aromatic foliage available in the barren and hard soils, orange and lemon trees, olive trees around the Mediterranean, and seafood in region has become a strong foundation element of the Mediterranean kitchen. Also legumes and raw vegetables that were spread through agriculture have developed the variety and richness of the kitchen [3]. Traditional Mediterranean basin diets contain fresh and natural food, vegetable, fruit, grains, bread, fish, olive oil, nuts such as walnut, peanut, hazelnut, wine in moderate dose, low level of milk and meat products, and poultry animals [4-7]. The following foods are rich in selenium, beta-carotene, vitamin C, vitamin E, antioxidants, glutathione, calcium and folate [8,9]. Mediterranean diet is the traditional nutritional habit of the people living around the countries located in the Mediterranean [5]. According to the definition of the Mediterranean diet, there is a single diet for all of the countries in the Mediterranean. However, there are different diets among many countries [6]. Tunisia, Morocco, some parts of Italy, Spain, Portugal, southern France, and Greece are the countries loyal to the fundamentals of this diet. Syria, Lebanon, Turkey and a part of Balkans also had used this diet [10]. In 1995 introduced the Mediterranean diet pyramid. This pyramid is based around southern Italy, Greece and Crete's typical food patterns. The aim behind the development of this model is to give a general idea of which food groups should be consumed how often [11]. As mentioned in the pyramid, the frequency of food consumption is as follows:

Daily consumption consists of vegetables (2 to 3 portions/day), fruits (4 to 6 portions/day), non-refined cereals and cereal products (such as brown rice, pasta, whole grain bread) low fat or

skimmed dairy products (1 to 2 portions/day), olive oil (as an extra fundamental lipid); weekly consumption of olive, potatoes, poultry, fish, nuts, and legumes (4 to 6 portion/week), desserts and eggs (1 to 3 portions/week); monthly consumptions of meat products and meat (4 to 5 portions/month) [12]. Daily physical activity holds an essential place in the Mediterranean diet. Physical activity does not constitute doing competitive sports or making an exhausting heavy marathon sprint. Therefore physical activity means spending energy to sustain control of weight and energy balance. Exercise is regularly performed physical activity and comprises repetitive and regular body movements. Exercises that are done to reinforce cardiorespiratory resistance, muscular durability and power and elasticity should be frequently done in the adolescent period. Sports such as volleyball, basketball, and swimming, running and walking are the types of exercises that should be done in the adolescent period [13,14].

At the base of the pyramid, brown rice, whole grain and products, liquid oils of quality, olive oil, sunflower oil, soy, peanut, corn, colza are present. The reason is due to the bran layer of whole grains, contrary to processed carbohydrates, are cannot be absorbed quickly by the body. In addition, these also regulate insulin and blood sugar, preventing diabetes. The effect of these foods on the level of the glucose levels in the blood varies. Glycemic Index (GI) is the measurement of the effects of the increase of glucose level after consumption of these foods. Glucose 100 is accepted as the fastest type of sugar that is mixed in blood and the GI levels of the food are determined through this. Healthy oils in the base level of the pyramid both affect cholesterol levels positively and protect people from a sudden stroke or any heart-related rhythm problems [15]. Legumes and dried nuts such as walnuts, almonds, and hazelnuts are an excellent source of minerals, vitamins, pulp, and protein. Dried nuts such as almonds and hazelnuts contain healthy fats and these fats mainly affect cholesterol and the health level of the heart [15]. Fruits and vegetables should be consumed 2 to 3 portions a day. In Mediterranean diet fruits and vegetables, are known by most of the people, grown and harvested locally in Mediterranean regions, consumed fresh, mainly either less processed or unprocessed in the relevant season. Plants and the roots of haw, radicchio, milk thistle, zucchini blossoms, corn poppy, and wild radish plants are especially consumed often in Mediterranean Region, Aegean Region and Crete [1,15]. Due to vegetables being rich in mineral and vitamin, food fiber content and low energy content, it is an essential group for human health and nutrition. Consumption of fruits and vegetables in their respective seasons, in relation to the personal state of the individual, physical activity, gender and age, and sufficient consumption reduces the risk of diabetes, cancer, hypertension, heart and vein diseases, and digestive system disorders, delays aging and strengthens the immune system [16].

Dairy products should be consumed 1 to 2 portions daily. To create bone structures and preserving the existing structure, vitamin D, calcium and exercise play a crucial role. Poultry animals, eggs and fish are important resources of protein. Consuming fish in various stages reduces the risk of heart diseases. Turkey and chicken are also a great source of protein and contains less amount of saturated fat compared to red meat. Desserts, pasta made out of white flour, white bread, and white rice are at the top of the pyramid in the Mediterranean diet. The reason for this is the sudden increase in blood sugar, weight gain, and the possibility of chronic disorders such as heart disease and diabetes. Due to its high ratio of saturated fat ingredient, butter, and red meat is also at the top of the pyramid. Those who frequently

consume red meat are recommended to consume fish and chicken occasionally [15]. Mediterranean diet is an example of balanced and sufficient nutrition [2]. While vegetative foods are a fundamental part of the diet, animal-based foods are mainly kept in the background. Consumption of legumes and plants that are commonly seen at many parts of the Mediterranean has been eased by the olive oil that enriches their taste and increases their energy. North African diet is based on legumes, vegetables, and couscous while, the South African diet is based on beans, chickpeas, vegetables, potatoes, rice, and pasta. This diet has the least allocation of sugar consumption [1].

In recent years, the Mediterranean diet has been scrutinized in terms of heart diseases and healthy nutrition. According to many research projects and nutrition experts, this diet is among the healthiest diets in the world to protect against many diseases such as cancer and heart diseases and to have a longer lifespan [1]. It is easy to apply the Mediterranean diet and appeals to the taste buds [17]. The most important components of the diet are olive oil and olive itself. Olive oil can be used in salads, or with the bread, in the raw and cooked form [11]. Olive oil due to its nature, the effects on the nutrition and the increased benefits through the prepared meals in cooking, have been used frequently in the Mediterranean diet [18]. The main components of the olive oil are comprised of: 0% to 1.5% Linolenic (Omega-3), Linoleic (Omega-6) fatty acids, and 55% to 85% Oleic acid (Omega-9). In addition, olive oil is a rich source of vitamin E [1]. Antioxidants, in other words, beta-carotene (vitamin A precursor) and vitamin E in olive oil help tissues and cells to replenish themselves. Especially it also plays an important role in preserving youth longer for women, and the development of children through the contained vitamins A, D, E, K, aging and obesity. Once consumed hot or cold, natural olive oil reduces the acidity of the stomach and protects it from ulcer and gastritis. Olive oil is the best absorbable oil by the intestines and has an absorbent regulatory aspect. It reduces the gallstone risk and helps to melt gallstones. It also helps the replenishment of the tissues and cells of the teeth and bones and delays aging [19]. Mediterranean diet is one of the nutritional models that have the healthiest dietary habit. Since the Mediterranean diet is a dietary model that is sufficient in terms of energy, vitamin-mineral, fruit and vegetables, whole grains; and it is rich in olive oil and fish, food deficiency issues are rare occurrences. Mediterranean diet, due to its healthy fat intake, low carbohydrate, effects, reduces chronic health risks such as cancer and cardiovascular disease. It has been found that adaptation to the Mediterranean diet has been associated with low mortality and morbidity rates [20-23].

From this point of view, the aim of this research is to determine the adaptation of adults living in the Turkish Republic of Northern Cyprus (TRNC) to the Mediterranean diet. Therefore, ascertaining the level of adaptation to the Mediterranean diet among the individuals living in TRNC, and the evaluation of the effect of area of residence on dietary habits has been aimed.

## Materials and Methods

### Research design and participants

Research has been conducted in the Turkish Republic of Northern Cyprus (TRNC) between the dates 01/02/2019 to 01/05/2019. This research has been prepared to evaluate meal patterns, meal frequency and identification of nutrition status in adults and the relation of physical activity level in adults; and it has been planned as cross-sectional research. The population of the research is comprised of people who live at TRNC and aged around 18-65.

In TRNC the relevant age group of individuals is 190754, showing the population of the research. Due to the research covering a wide scope and causing issues at cost and time in reaching the whole area, the research has been sampled with this population. In deciding this sampling, a basic sampling method has been used. This sampling method is comprised of people who are believed to have answers to the researcher's problem. In terms of specifying the sampling size that will be represented by the population in question:

$$n = Nt^2 pq / d^2 (N - 1) + t^2 pq$$

**N:** The number of individuals at the target populace, (190,754 people)

**n:** The number of individuals to be sampled.

**p:** The prevalence of the researched incident (0,9)

**q:** The frequency of non-occurrence of the researched incident (0,1)

**t:** Within a specified level of significance, theoretic level according to the t table (For sampling error of 5% and trust level of 95%, it has been assumed as 1.96)

**d:** Depending on the prevalence of the incident +/- sampling error. (0.05)

By using the formula population of the research is in a 95% confidence interval, with a sampling error of  $\pm 5\%$  the required sampling size has been calculated,  $n=383$  individuals. Accordingly, 450 participants have been given a questionnaire. 28% of the participants' data have been identified as either incomplete or contradictory. And these participants have been excluded from the scope of the research. Therefore the sampling of this research is comprised of 422 people in the age groups of 16 to 65.

### Data collection tools of the research

During the research, General Information Form, Dietary Habits Form, Food Consumption Frequency Form, and Mediterranean Diet Quality Index Form have been used as the general tools for gathering data. General information form is comprised of questions about sociocultural, socioeconomic and personal characteristics [24-27]. Through food consumption frequency form, the frequency of the consumed food from last 1 month has been calculated by the options "didn't consume, every day, 5 to 6 times in a week, 3 to 4 times in a week, 1 to 2 times in a week, 1 time in 15 days and once in a month" [28,29]. To collect data regarding the identification of dietary situations, the Mediterranean diet quality index form has been used. The form question paper contains 16 questions. While the 1<sup>st</sup> to 11<sup>th</sup>, 13<sup>th</sup>, and 15<sup>th</sup> questions have been evaluated as positive (+1); 6<sup>th</sup>, 12<sup>th</sup>, 14<sup>th</sup>, and 16<sup>th</sup> questions have been calculated as negative (-1) values. The evaluation result is defined as  $\geq 8$  points: optimal diet; 4 to 7 points: Diet requires intervention;  $\leq 3$  points very low diet quality [18].

Before the collection of the data, an application has been made to the Near East University Ethical Council and YDU/2019/67-778 numbered 28/03/2019 dated "Ethical Council Approval" has been received.

### Data analysis

For the statistical analysis of the data gathered from the research, SPSS 23.00 statistics packet software was used. Upon the evaluation of research data, statistical identifier methods (average, standard

deviation, frequency) have been prioritized. Upon the comparison of independent dual group's t-test, for the comparison of three and more independent groups, ANOVA and Scheffe Test of Post Hoc test was used. Collected findings have been evaluated as a confidence interval by 95% and significance level by 5%.

## Results and Discussion

46% of the participants are male and 54% are female. 37% of the participants aged below 25 years old, 31.8% are aged 26 to 35 years old, and 31.3% are above 36 years old. The youngest participant is aged 18; the eldest participant is aged 65. The average of the ages is  $34.27 \pm 10.68$ . 51.2% of the participants are average weighed, 38.4% are overweight, and 10.4% are obese. The average of the BMI is  $24.98 \pm 4.66$ . The lowest ratio is 16.28; the highest ratio is 41.47. The average of the weight is  $72.51 \pm 16.06$ ; the lightest weighed participant is 42 kg, the heaviest weighed is 145 kg. The average of the height is  $169.97 \pm 8.19$ . The shortest participant is 152 cm; the tallest participant is 195 cm. While 55% of the participants had changed in their body mass within the last six months, 39.8% had not any change. 51.2% of the participants are single, 48.8% are married. 29.4% are high school, 54.5% are university, and 16.1% are master's degree graduates. 76.8% of the participants live with their families, while 12.3% are living with their friends, and 10.9% live alone. 32.7% of the participants have used vitamin-mineral tablets within the last 12 months. 37.9% of the participants have smoked cigarettes. The rates of the participants who use cigarettes, 11.4% smoke 1 to 4 pieces daily, 11.4% smoke 5 to 9 pieces daily, 49.9% smoke 10 to 19 pieces daily, and 27.8% smoke 20 pieces and more in a day. 24.6% of the participants have been diagnosed by an expert with an illness. 7.1% have been diagnosed with adiposity, 8.6% with ulcer-gastritis, 7.1% with diabetes, 18.6% with hypertension, 1.4% hypotension, and 11.4% with iron deficiency anemia, 7.1% with hyperlipidemia and cholesterolemia, 7.1% with kidney disease, 1.4% with liver-gall bladder illness, 4.3% with food allergies, 5.7% with psychiatric disorders and 20% with other diseases.

38.5% of the participants have been using medical-dietary treatment for the illness. Participants who followed a medical nutrition treatment, by 31.8% for weight loss, by 10.5% for low fat including cholesterol, by 26.3% for no-salt, sodium limited, by 10.5% compatible with diabetes, by 2.6% low pulped, by 5.3% high pulped, by 2.6% protein limited and by 10.5% have followed a diet for other illnesses. 52.4% of the participants have received their dietary treatment from a dietician, 31% from a doctor, 9.5% from the internet and 7.1% from other parties/places. 7.1% of the participants have one, 28.4% have two and 64.5% have three main meals a day. While 18.5% of the participants don't have any refreshments; 29.9% have one, 51.7% have two and more refreshments. 77.7% of the participants skip meals. 59.1% of the participants skip breakfast, 35.4% skips lunch and 5.5% skip dinner. The average consumption of water is  $8.30 \pm 4.32$ . Least consumption is one liter and the most consumption is 30 liters. Finally, 53% skips a meal due to insufficient time, 26.2% due to feeling disinclined and loss of appetite, 11% due to not having a habit and 9.8% due to other factors.

47.9% of the participants prepare their own food, 29.4% by their parents, and 22.7% by other parties. 73.5% of the participants use olive oil, 23.2% use vegetable oils, 0.5% use margarine, 1.9% use butter and 0.9% use other oils. 83.9% of the participants limit salt usage. 82% of the participants prefer whole grain products, 57.3% prefer snacks such as potato chips and popcorn. 54% of the participants limit themselves to eating something before the main meals. 34.6% of the

Table 1: Information regarding food consumption.

	No Consumption	Every day	5-6 Times in a week	3-4 Times in a week	1-2 Times in a week	Once in 15 days	Once in a month
Low fat milk, yogurt	156 (%37.0)	90 (%21.3)	32 (%7.6)	68 (%16.1)	52 (%12.3)	10 (%2.4)	14 (%3.3)
Full fat milk, yogurt	46 (%10.9)	142 (%33.6)	58 (%13.7)	62 (%14.7)	78 (%18.5)	20 (%4.7)	16 (%3.8)
Cheese	4 (%1.4)	178 (%42.2)	94 (%22.3)	84 (%19.9)	52 (%12.3)	4 (%0.9)	4 (%0.9)
Red meat	14 (%3.3)	16 (%3.8)	48 (%11.4)	160 (%37.9)	150 (%35.5)	26 (%6.2)	8 (%1.9)
Giblets	188 (%44.5)	8 (%1.9)	4 (%0.9)	24 (%5.7)	22 (%5.2)	64 (%15.2)	112 (%26.5)
Sausage, salami, pastrami	150 (%35.5)	4 (%0.9)	4 (%0.9)	28 (%6.6)	62 (%14.7)	44 (%10.4)	130 (%30.8)
Chicken, turkey	22 (%5.2)	28 (%6.6)	44 (%10.4)	192 (%45.5)	90 (%21.3)	32 (%7.6)	14 (%3.3)
Fish	14 (%3.3)	6 (%1.4)	12 (%2.8)	42 (%10.0)	194 (%46.0)	92 (%21.8)	62 (%14.7)
Egg	12 (%2.8)	56 (%13.3)	46 (%10.9)	178 (%42.2)	102 (%24.2)	14 (%3.3)	14 (%3.3)
Legume	18 (%4.3)	22 (%5.2)	26 (%6.2)	56 (%13.3)	172 (%40.8)	86 (%20.4)	42 (%10.0)
Bread	24 (%5.7)	256 (%60.7)	34 (%8.1)	64 (%15.2)	30 (%7.1)	4 (%0.9)	10 (%2.4)
Bulgur, rice, pasta etc.	8 (%1.9)	54 (%12.8)	52 (%12.3)	190 (%45.0)	102 (%24.2)	8 (%1.9)	8 (%1.9)
Green leaved vegetables	4 (%0.9)	88 (%20.9)	72 (%17.1)	178 (%42.2)	66 (%15.6)	12 (%2.8)	2 (%0.5)
Other vegetables	4 (%0.9)	46 (%10.9)	42 (%10.0)	132 (%31.3)	184 (%43.6)	14 (%3.3)	-
Potatoes	16 (%3.8)	18 (%4.3)	28 (%6.6)	92 (%21.8)	214 (%50.7)	42 (%10.0)	12 (%2.8)
Citrus fruits	12 (%2.8)	44 (%10.4)	42 (%10.0)	128 (%30.3)	148 (%35.1)	34 (%8.1)	14 (%3.3)
Other fruits	6 (%1.4)	64 (%15.2)	92 (%21.8)	134 (%31.8)	88 (%20.9)	30 (%7.1)	8 (%1.9)
Butter, margarine	56 (%13.3)	30 (%7.1)	30 (%7.1)	50 (%11.8)	102 (%24.2)	116 (%27.5)	38 (%9.0)
Liquid oils	120 (%28.4)	96 (%22.7)	42 (%10.0)	52 (%12.3)	32 (%7.6)	38 (%9.0)	42 (%10.0)
Olive oil	16 (%3.8)	256 (%60.7)	48 (%11.4)	62 (%14.7)	28 (%6.6)	2 (%0.5)	10 (%2.4)
Olive	20 (%4.7)	146 (%34.6)	100 (%23.7)	52 (%12.3)	72 (%17.1)	20 (%4.7)	12 (%2.8)
Honey, jam	44 (%10.4)	48 (%11.4)	26 (%6.2)	100 (%23.7)	124 (%29.4)	52 (%12.3)	28 (%6.6)
Molasses	96 (%22.7)	72 (%17.1)	26 (%6.2)	58 (%13.7)	82 (%19.4)	40 (%9.5)	48 (%11.4)
Chocolate etc.	30 (%7.1)	46 (%10.9)	54 (%12.8)	88 (%20.9)	124 (%29.4)	48 (%11.4)	32 (%7.6)
Pastry	30 (%7.1)	16 (%3.8)	12 (%2.8)	64 (%15.2)	172 (%40.8)	88 (%20.9)	40 (%9.5)
Milk puddings	46 (%10.9)	8 (%1.9)	12 (%2.8)	58 (%13.7)	128 (%30.3)	92 (%21.8)	78 (%18.5)
Cake, biscuit	34 (%8.1)	20 (%4.7)	18 (%4.3)	92 (%21.8)	128 (%30.3)	82 (%19.4)	48 (%11.4)
Carbonated drinks	92 (%21.8)	124 (%29.4)	30 (%7.1)	52 (%12.3)	48 (%11.4)	38 (%9.0)	38 (%9.0)
Instant fruit juice	234 (%55.5)	18 (%4.3)	16 (%3.8)	32 (%7.6)	46 (%10.9)	30 (%7.1)	46 (%10.9)
Instant soup	280 (%66.4)	4 (%0.9)	6 (%1.4)	22 (%5.2)	30 (%7.1)	32 (%7.6)	48 (%11.4)
Hamburger, pitta etc.	72 (%17.1)	12 (%2.8)	6 (%1.4)	20 (%4.7)	124 (%29.4)	128 (%30.3)	60 (%14.2)
Donner kebab	58 (%13.7)	12 (%2.8)	10 (%2.4)	22 (%5.2)	152 (%36.0)	108 (%25.6)	60 (%14.2)
Instant canned food	158 (%37.4)	4 (%0.9)	10 (%2.4)	24 (%5.7)	54 (%12.8)	94 (%22.3)	78 (%18.5)
Frozen food	120 (%28.4)	6 (%1.4)	6 (%1.4)	30 (%7.1)	78 (%18.5)	112 (%26.5)	70 (%16.6)
French fries	42 (%10.0)	10 (%2.4)	24 (%5.7)	84 (%19.9)	160 (%37.9)	68 (%16.1)	34 (%8.1)
Ice cream	50 (%11.8)	26 (%6.2)	20 (%4.7)	144 (%34.1)	90 (%21.3)	50 (%11.8)	42 (%10.0)
Mineral water, fizzy water	60 (%14.2)	128 (%30.3)	48 (%11.4)	64 (%15.2)	56 (%13.3)	44 (%10.4)	22 (%5.2)
Coffee, Nescafe	12 (%2.8)	324 (%76.8)	26 (%6.2)	24 (%5.7)	22 (%5.2)	12 (%2.8)	2 (%0.5)
Tea (black, green)	24 (%5.7)	274 (%64.9)	28 (%6.6)	52 (%12.3)	26 (%6.2)	10 (%2.4)	8 (%1.9)
Herbal tea	48 (%11.4)	186 (%44.1)	26 (%6.2)	50 (%11.8)	58 (%13.7)	28 (%6.6)	26 (%6.2)
Alcoholic drinks	76 (%18.0)	28 (%6.6)	24 (%5.7)	130 (%30.8)	88 (%20.9)	36 (%8.5)	40 (%9.5)
Wine	118 (%28.0)	12 (%2.8)	6 (%1.4)	58 (%13.7)	120 (%28.4)	52 (%12.3)	56 (%13.3)
Breakfast desserts	82 (%19.4)	52 (%12.3)	40 (%9.5)	132 (%31.3)	68 (%16.1)	30 (%7.1)	18 (%4.3)
Simit	82 (%19.4)	12 (%2.8)	4 (%0.9)	64 (%15.2)	136 (%32.2)	76 (%18.0)	48 (%11.4)
Potato chips etc.	80 (%19.0)	16 (%3.8)	14 (%3.3)	90 (%21.3)	130 (%30.8)	46 (%10.9)	46 (%10.9)

**Table 2:** Distribution regarding Mediterranean Diet Quality.

	n	%
<b>Mediterranean diet quality</b>		
Optimal diet	241	57.1
Diet requires intervention	132	31.3
Very low diet quality index	49	11.6

**Table 3:** Differentiation of Mediterranean Diet Quality.

	n	X	ss	t	p
<b>Gender</b>					
Male	194	2.94	2.3	-2.74	<b>0.006</b>
Female	228	3.55	2.28		
<b>Nationality</b>					
KKTC	324	3.28	2.32	1.03	0.304
TR	98	3.01	2.26		
<b>Age</b>					
Aged 25 and below <sup>1</sup>	156	3.27	2.16		0.046
Aged 26-35 <sup>2</sup>	134	3.09	2.18	1.66	<b>1&gt;3</b>
Aged 36 and above <sup>3</sup>	132	2.89	2.04		<b>2&gt;3</b>
<b>BMI</b>					
Normal weighed <sup>1</sup>	216	4.14	2.39		<b>0.02</b>
Overweighed <sup>2</sup>	162	3.12	2.44	3.93	<b>1&gt;2</b>
Obese <sup>3</sup>	44	3.11	2.04		<b>1&gt;3</b>
<b>The change occurred in body mass within last 6 months</b>					
Yes <sup>1</sup>	232	3.43	2.2		<b>0.039</b>
No <sup>2</sup>	168	3.15	2.29	2.32	<b>1&gt;2</b>
Doesn't know <sup>3</sup>	22	2.36	3.08		<b>1&gt;3</b>
<b>Marital status</b>					
Single	216	3.27	2.28	0.48	0.631
Married	206	3.17	2.34		
<b>Educational Level</b>					
High school <sup>1</sup>	124	3.23	2.22		
Graduate <sup>2</sup>	230	3.27	2.35	0.33	0.717
Post-graduate <sup>3</sup>	68	3.01	2.31		
<b>Cohabitants</b>					
Family <sup>1</sup>	324	3.5	2.75		
Alone <sup>2</sup>	46	3.24	2.16	1.94	0.36
Friends <sup>3</sup>	52	2.85	2.72		<b>1&gt;3</b>
<b>The usage of vitamin-mineral tablet within last 12 months</b>					
Used	138	2.84	2.27		
Didn't use	284	3.4	2.31	-2.37	<b>0.018</b>
<b>The instance of cigarette usage</b>					
Uses	160	3.34	2.48		
Doesn't use	262	3.15	2.19	0.83	0.405
<b>Alcohol usage</b>					
Uses	294	3.23	2.3	1.03	0.302
Doesn't use	128	3.2	2.33		
<b>Any illness that was diagnosed by an expert</b>					
Available	104	3.42	2.22	1.03	0.302

Not available	318	3.15	2.33		
<b>The number of consumed daily main meals</b>					
1 meal <sup>1</sup>	30	2.9	2.84		
2 meals <sup>2</sup>	120	3.24	2.04	0.31	0.733
3 meals <sup>3</sup>	272	3.25	2.36		
<b>The number of consumed daily refreshment meals</b>					
Doesn't consume <sup>1</sup>	78	3.23	2.01		
1 refreshment meal <sup>2</sup>	126	3.37	2.19	0.04	0.68
2 and more refreshment meals <sup>3</sup>	218	3.13	2.47		
<b>The instance of skipped meals</b>					
Doesn't consume <sup>1</sup>	78	3.23	2.01		
1 refreshment meal <sup>2</sup>	126	3.37	2.19	0.04	0.68
2 and more refreshment meals <sup>3</sup>	218	3.13	2.47		
<b>The party who cooks the meals</b>					
On their own <sup>1</sup>	202	3.01	2.38		
Parents <sup>2</sup>	124	3.43	2.12	1.62	0.198
Others <sup>3</sup>	96	3.4	2.37		
<b>The water consumption</b>					
Optimal diet <sup>1</sup>	241	8.01	3.8		
Diet require intervention <sup>2</sup>	132	9.04	5.07	2.92	0.055
Very low diet quality index <sup>3</sup>	49	7.73	4.4		

participants use sugar in their tea, coffee, etc. 67.3% of the participants consumes oily seeds such as walnuts, almonds, hazelnuts. 50.7% of the participants pay attention to the daily intake of vegetables. 66.8% of the participants prefer fish.

Evaluation of the daily consumption regarding food is primarily by 76.8% is coffee, Nescafe, 64.9% is tea, by 60.7% olive oil and 60.7% bread. The majority of the food that is not consumed by the participants is 66.4% instant soup, 55.5% instant fruit juice and 44.5% giblets (Table 1).

Evaluation of the quality of the diet shows that by 57.1% the majority has an optimal diet, 31.3% require intervention to their diet, and 11.6% have a very low-quality index (Table 2).

The quality of the Mediterranean diet differentiates on gender ( $p<0.05$ ). The average of female participants is significantly higher than male participants. The quality of the Mediterranean diet differentiates by age ( $p<0.05$ ). Therefore, participants aged 36 and above have significantly lower diet quality. The quality of the Mediterranean diet differentiates by BMI ( $p<0.05$ ). The average of normal weighted participants is significantly higher than overweighed and obese participants. The quality of the Mediterranean diet differentiates by the change occurred in the body within the last 6 months ( $p<0.05$ ). Therefore, the diet quality of those with weight change is significantly higher than the groups who don't know and haven't had any change. The quality of the Mediterranean diet does not differentiate by marital status, education level ( $p>0.05$ ). The cohabitants ( $p<0.05$ ). Therefore, people who live with their parents have significantly higher diet quality than the ones living with their friends. Quality of the Mediterranean diet differentiates by vitamin-mineral tablet usage within the last 12 months ( $p<0.05$ ). The average of participants who do not use is significantly higher than the ones who use it. The quality of the Mediterranean diet does not differentiate by cigarette

usage, alcohol usage ( $p>0.05$ ). Quality of the Mediterranean diet does not differentiate by any existing illness diagnosed by an expert, the number of consumed daily main meals, the number of consumed daily refreshment meals, skipping meals ( $p>0.05$ ). The quality of the Mediterranean diet is significantly higher in the participants who do not skip a meal. Quality of the Mediterranean diet does not differentiate by the party who cooks the meals ( $p>0.05$ ). Water consumption does not differentiate by the Mediterranean diet quality index ( $p>0.05$ ) (Table 3).

## Discussion

Obesity is one of the most commonly encountered health issues that were seen in modern societies. And both in the developed and developing countries and in our country it has reached the levels of an epidemic, and became a gradually increasing frequent issue that is not preventable, but also a global public health issue [30-33]. Within this framework of the research, the BMI values of the participants have been examined. According to the findings, 51.2% of the participants have normal weight, 38.4% are overweight and 10.4% are obese respectively. The average of the BMI is  $24.98 \pm 4.66$ . According to the research conducted by [34], where the university students in Cyprus evaluated adaptation to the Mediterranean diet, 4.1% of the participants are obese and 24.9% are overweight. Research results in the literature generally correspond to the BMI profile of the research sampling.

As defined by Angel Keys for the first time, the fundamental property of the Mediterranean diet is the variety of food [2]. Aromatic foliage available in the barren and hard soils, orange and lemon trees, olive trees around the Mediterranean, and seafood in region has become a strong foundation element of the Mediterranean kitchen. Also legumes and raw vegetables that were spread through agriculture have developed the variety and richness of the kitchen [35]. Traditional Mediterranean basin diets contain fresh and natural food, vegetable, fruit, grains, bread, fish, olive oil, nuts such as walnut, peanut, hazelnut, wine in moderate dose, low level of milk and meat products, and poultry animals [3-7]. The following foods are rich in selenium, beta-carotene, vitamin C, vitamin E, antioxidants, glutathione, calcium and folate [8,9]. Daily consumption in Mediterranean diet consist of vegetables (2 to 3 portions/day), fruits (4 to 6 portions/day), non-refined cereals and cereal products (such as brown rice, pasta, whole grain bread) low fat or skimmed dairy products (1 to 2 portions/day), olive oil (as an extra fundamental lipid); weekly consumption of olive, potatoes, poultry, fish, nuts, and legumes (4 to 6 portions/week), desserts and eggs (1 to 3 portions/week); monthly consumptions of meat products and meat (4 to 5 portions/month) [12]. The most critical components of the diet are olive oil and olive itself. Olive oil can be used in salads, or with the bread, in the raw and cooked form [11]. Olive oil due to its nature, the effects on the nutrition and the increased benefits through the meals it has been used to cook, has been used frequently in the Mediterranean diet [18]. Antioxidants, in other words, beta-carotene (vitamin A precursor) and vitamin E in olive oil help tissues and cells to replenish themselves. Notably it also plays a vital role to preserve youth longer for women, and the development of children through the contained vitamins A, D, E, K, aging and obesity. Once consumed hot or cold, natural olive oil reduces the acidity of the stomach and protects it from ulcer and gastritis. Olive oil is the best absorbable oil by the intestines and has an absorbent regulatory aspect. It reduces the gallstone risk and helps to melt gallstones. It also helps

the replenishment of the tissues and cells of the teeth and bones and delays aging [19]. At this point within the scope of the research, 73.5% of the participants prefer olive oil in their meals. And this ratio is followed by vegetable oils by 23.3%. Therefore, it can be concluded that the research sampling caused a change in oil preference that is suitable for the Mediterranean diet. Within the framework of the research, it was concluded that the majority of 83.9% of participants limit their salt intake. Excessive salt usage causes many illnesses such as osteoporosis, goiter, hypertension, and cancer [32]. According to WHO, the daily salt usage should be limited with 5 gr [36]. In addition, the Mediterranean diet also limits salt usage. Therefore, it has been considered that the participants in the research have limited salt usage to maintain adaptation to the Mediterranean diet.

Another important food component in the Mediterranean diet is whole grain products [15]. It has been recommended to consume an average of 8 portions daily in the diet [37]. It has been stated that whole grain resource foods reduce the risk of type 2 diabetes, coronary heart disease, and cancer occurrence. Additionally, whole grains are low of glycemic index and regulate insulin values, therefore protecting vein functions. Additionally, whole grains regulate weight control and help the digestive system to work correctly. Whole grains' effect on health is associated with being rich in vitamin, mineral, diet pulp, lignin, beta-glucan, inulin, phytosterol and many phytochemicals [38]. It has been observed that the majority of 83.9% of the participants have preferred whole grain products that are suitable for the Mediterranean diet. Recently conducted researches frequently emphasize the negative effect caused by free sugar on human health by such nutritional elements as fast-food, chips, and cola. Through guide prepared, World Health Organization indicates the correct free sugar intake in adults and children, and emphasizes that accurate free sugar consumption acts as an important factor in the prevention of non-communicable diseases and dents. Additionally, consumption of free sugars, chips, and coke are the most important risk factors of diabetes, cardiovascular diseases and obesity [39]. In the research, it has been observed that 65.4% of TRNC citizens do not use sugar with drinks such as tea and coffee. This result, as indicated by other works in the literature, increases the suitability level towards the Mediterranean diet. According to another finding of the research, 67.3% of the participants consume fatty seeds such as walnut, almond, and hazelnuts as refreshments. Dried nuts such as walnuts, almonds, and hazelnuts are an excellent source of minerals, vitamins, pulp, and protein. Dried nuts such as almonds and hazelnuts contain healthy fats and these fats mainly affect cholesterol and the health level of the heart [15]. At this point, participants have parallel refreshment habits towards the Mediterranean diet. Within the scope of the Mediterranean diet, vegetables should be consumed 2 to 3 portions a day. Due to vegetables being rich in mineral and vitamin, food fiber content and low energy content, it is an essential group for human health and nutrition. Consumption of fruits and vegetables in their respective seasons, in relation to the personal state of the individual, physical activity, gender and age, and sufficient consumption reduces the risk of diabetes, cancer, hypertension, heart and vein diseases, and digestive system disorders, delays aging and strengthens the immune system [16]. In the research sampling, it has been found that the people who pay attention to their vegetable consumption is 50.7%.

Fish consumption in the Mediterranean diet is vital due to fish being an outstanding food and due to the inverse proportion between fish consumption and mortality rates caused by coronary heart disease [40]. Some researchers believe that saturated fats in a diet

affects memory and increase the potential risk of Alzheimer's disease. Fatty acids are 1/5 of the dry weight of the human brain, and 20% of these fatty acids are in omega-3 Docosahexaenoic Acid (DHA) form and this is concentrated in nerve synapses and has anti-inflammatory properties that prevent Alzheimer's disease. It has been reported that fatty fish such as sardine and anchovy have important benefits. Fatty fish is a source of omega-3, which is a type of multi-unsaturated fatty acid. And it is beneficial for the heart due to its anti-inflammatory effect, and it prevents vasodilation blood veins. Additionally, it has been stated that Eicosapentaenoic Acid (EPA), which is another type of omega-3 fatty acid, and DHA prevents carcinogenesis. The examination of conducted researches shows that having fish in a person's diet acts as a shield against cardiovascular diseases. In the panel where the studies on the side effects of the cardiovascular diseases were examined, the recommended diets for EPA and DHA 25 to 500 mg/day [41]. However, according to the conducted researches indicate that the fish consumption in our country generally is at a low level [42-44]. In the results of the research, 66.8% of the sampling prefers consuming fish. This result can be associated with TRNC being located on a shore and adaptation to the Mediterranean diet.

On the evaluation regarding food consumption of the participants, the daily consumed products are mostly 76.8% coffee, 64.9% tea, 60.7% olive oil and 60.7% bread. In a research conducted by [45] in Edirne province, individuals consume 175 g of bread daily. Additionally [46] have presented that in our country tea consumption is very intense and this ratio is followed by Turkish coffee, espresso, filtered coffee, instant coffee, and iced coffee accordingly. These results show that research sampling, through the concentrated consumption of coffee, tea, and bread consumption, is compatible with Turkey's profile. Also, olive oil being one of the most consumed foods by the participants indicates adaptation to the Mediterranean diet.

Evaluation of diet quality indicates that by 57.1% majority of the participants have an optimal diet, 31.3% of the participant group requires intervention to their diet, and 11.6% of the participants have a very low-quality index in their diet. In a research made by [47], it has been identified that out of 400 adults 2.7% have an optimal diet and 78.8% require intervention and 18.8% have a very low-quality index. In another research made by Oteles and Bilgic (209), it has been stated that 8.9% of the participants have optimal, 52.6% require intervention and 38.5% have a very low-quality index in their diet. As for the research made by [34] to examine university students living in Cyprus, the average adaptation to the Mediterranean diet is high and those who have optimal diet are in the majority. These results indicate that in our country individuals generally require intervention to their diets in accordance with Mediterranean Diet Quality Index, and Mediterranean regions such as Cyprus apply the Mediterranean diet at an optimum level. Therefore, this result supports the research finding.

In a comparison made between genders, it has been identified that the diet quality index is higher in females. Once the researches on the topic have been examined, contradictory results can be observed. Have found that quality indexes of females are significantly higher than males, in parallel to the research findings of the current research. Another finding of the research indicates that Mediterranean diet quality does not differentiate by age. Therefore participants aged 36 and above have significantly lower dietary quality. This result shows that dietary quality is higher among young individuals. According to the meta-analysis research done in Cyprus by [48], as parallel to this

finding, it has been identified that the lower age groups have a higher adaptation to the Mediterranean diet. It has been considered that the reasons behind such a result are individuals of younger ages wish to lose weight due to high body image concern and more willing to apply for diet programs. Another finding of the research that supports this claim is the significant difference in the Mediterranean diet quality index according to body mass index. The group consists of normally weighed individuals who have a higher Mediterranean diet quality index than overweighted and obese. Also, the Mediterranean diet quality differentiates upon the changes that occurred at the body mass within the last 6 months. According to this, those who had a change in body mass have significantly higher diet quality than other groups. At this point, the prominent advantages of the Mediterranean diet in terms of health on weight control are higher [41].

Another finding of the research indicates that the Mediterranean diet quality index does not differentiate by marital status. By the majority of 47.9% of participants' cooking their own meals and it is followed by parents with a ratio of 29.4% supports the claim of no difference in diet quality by the party who cooks the meals. Additionally, the evaluations regarding the cohabitants verify the claim. Accordingly, those who live with their parents have significantly higher diet quality than those who live with their friends. It has been confirmed by other researches that individuals who live with their friends dine out more and preferred food usually consisting of fast-food products [49,50]. Therefore, the expectation regarding the consumption of fast-food products lowers the Mediterranean diet quality index in parallel.

According to the evaluation results regarding the education level, Mediterranean diet quality does not differentiate in terms of education level. For such a result it has been considered that the Mediterranean diet is independent of education level, and TRNC being located at the shores of the Mediterranean is generally effective as a nutrition culture. In the researches regarding the topic conducted at Cyprus and Mediterranean specific, similar findings have been found [34,48]. In terms of cigarette and alcohol consumption, it has been identified that the Mediterranean diet quality index does not differentiate by cigarette and alcohol consumption.

According to another finding of the research, the Mediterranean diet quality score does not differentiate towards the total main meal and refreshment amounts. In addition to participants generally having different meal numbers, it has been considered that adaptation to the Mediterranean diet has caused such finding. At this point, the important aspect is thought to be skipping meals rather than meal numbers. Thus it has been identified that in the other conducted analyses diet quality index differentiates by skipping meals. Accordingly, participants who don't skip meals have significantly higher diet quality indexes. Participants who have a higher diet quality index through complying with a determined diet program are anticipated. Similarly [51] has identified an opposite relation between skipping meal and diet quality index in their work. Also, other works in the literature show a positive relation between regular diet and diet quality index [52]. As for the evaluation of water consumption, the Mediterranean diet quality index does not affect by water consumption. As so in the other diet programs, water consumption has an important place in the Mediterranean diet. Within diet's scope, daily water consumption of 1.5 to 2 liter has been recommended with the variability of personal and environmental changes in mind [53,54]. However, due to sampling's average daily water consumption being

close to the threshold, it can be said that no significant difference in terms of diet quality index is within expectations.

## Conclusion

Once research findings have been evaluated generally, important proofs of individuals who live in The Turkish Republic of Northern Cyprus remain complying with the Mediterranean diet draws attention. Once the well-documented health benefits of the Mediterranean diet have been considered, it has been considered that nationals' adaptation levels to the diet will create a protective factor towards health issues in the long term. In this context, it has been recommended to conduct public information movements regarding the Mediterranean diet in both The Turkish Republic of Northern Cyprus and Turkey.

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