T.C.
YEDITEPE UNIVERSITY
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DEPARTMENT OF NUTRITION AND DIETETICS

COMPARISON OF DIETARY HABITS OF INDIVIDUALS DIAGNOSED AS DIABETES, HYPERTENSION AND HYPERLIPIDEMIA WHO ATTENDING DIET POLYCLINIC AT A PRIVATE HOSPITAL

MASTER THESIS

FATMA TANDOĞAN

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APPROVAL

This thesis has been deemed by the jury in accordance with the relevant articles of Yeditepe University Graduate Education and Examinations Regulation and has been approved by Administrative Board of Institute with decision dated 31.07.2019..... and numbered .2019/13-11

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Director of Institute of Health Sciences

DECLARATION

I hereby declare that this thesis is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which has been accepted for the award of any other degree except where due acknowledgment has been made in the text.

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Signature

Fatma TANDOĞAN

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FATMA TANDOGAN

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LIST OF SYMBOLS AND ABBREVIATIONS

DM : Diabetes Mellitus

WHO : World Health Organization

USA : United States of America

DASH : Dietary Approaches to Stop Hypertension

FAO : Food and Agriculture Organization of the United Nations

LDL : Low Density Lipoprotein

USDA : United States Department of Agriculture

TURKSTAT : Turkish Statistical Institute

TURDEP : Turkey Diabetes, Hypertension, Obesity and Endocrinology Diseases Prevalence Study

NHANES : The National Health and Nutrition Examination Survey

VLDL : Very Low Density Lipoprotein

IDL : Intermediate Density Lipoprotein

HDL : High Density Lipoprotein

ANOVA : One-Way Analysis of Variance

Min : Minimum

Max : Maximum

SD : Standard Deviation

n : Number of Samples

p : Probability Value

ABSTRACT

Tandoğan, F. Comparison of Dietary Habits of Individuals Diagnosed as Diabetes, Hypertension and Hyperlipidemia Who Attending Diet Polyclinic at a Private Hospital. Istanbul, Yeditepe University, Institute of Health Sciences, Department of Nutrition and Dietetics, 2019.

This study conducted with a total of 150 participants, 52 from diabetes group (mean age: 38.71±14.60 year), 43 from hypertension group (mean age: 43.05±12.25 year) and 55 from hyperlipidemia group (mean age: 36.49±8.73 year) for comparing of dietary habits of individuals are diagnosed as diabetes, hypertension and hyperlipidemia. In our study, information form prepared by researcher and food frequency questionnaire form were used for collecting data. In the information form, questions about sociodemographic characteristics (age, gender, educational status, body mass index (BMI), medication) and dietary habits (number of meals, frequency of meals, snacking habits) of the participants were asked. In addition, the consumption frequency of the five food groups (milk and its derivatives, meat and its derivatives, vegetables and fruits, bread and other cereals, sugar and sweets) was examined in the food frequency questionnaire. SPSS 21.0 was used for the statistical analysis. The results were evaluated at $p < 0.05$ statistical significance level and 95% confidence interval. BMI was higher among diabetes group (34.03±7.73) compared to hypertension (33.04±6.09) and hyperlipidemia (30.78±4.61) groups and there's a significant difference between groups statistically ($p<0.03$). When compared red meat consumption, it was higher among diabetes group (48.4%, n=25) compared to hypertension (34.9%, n=20) and hyperlipidemia (34.5%, n=19) groups and there's a significant difference between groups statistically ($p<0.00$). When compared egg consumption, it was higher among diabetes (51.9%, n=27) and hyperlipidemia (58.2%, n=32) groups compared to hypertension group (39.5%, n=17) and there's a significant difference between groups statistically ($p<0.04$). When compared to the consumption frequency of milk and its derivatives, other meat products, vegetables and fruits, bread and other cereals and sugar and sweets, there's no significant difference between groups statistically ($p>0.05$). In conclusion, in our study, the dietary habits of three groups showed different characteristics. Comparison of dietary habits of individuals with chronic disease may contribute to the establishment of an appropriate nutrition plan and treatment success in the appropriate patient.

Key words: Nutrition, Dietary habits, Diabetes, Hypertension, Hyperlipidemia

ABSTRACT (Turkish)

Tandoğan, F. Özel Bir Hastanedeki Diyet Polikliniğine Başvuran Diyabet, Hipertansiyon ve Hiperlipidemi Tanısı Almış Bireylerin Beslenme Alışkanlıklarının Karşılaştırılması. İstanbul, Yeditepe Üniversitesi Sağlık Bilimleri Enstitüsü, Beslenme ve Diyetetik ABD. 2019.

Bu çalışma, diyabet, hipertansiyon ve hiperlipidemi tanısı almış bireylerin beslenme alışkanlıklarının karşılaştırılması amacıyla, diyabet grubundan 52 (yaş ort: 38,71±14,60 yıl), hipertansiyon grubundan 43 (yaş ort:43,05±12,25 yıl) ve hiperlipidemi grubundan 55 (yaş ort:36,49±8,73 yıl) olmak üzere toplam 150 katılımcı ile yapılmıştır. Çalışmamızda veri toplama aracı olarak, bilgi toplama formu ve besin tüketim sıklığı kayıt formu kullanılmıştır. Bilgi toplama formunda katılımcıların sosyodemografik özellikleri (yaş, cinsiyet, öğrenim durumu, beden kitle indeksi (BKİ), ilaç kullanımı) ve beslenme alışkanlıkları (öğün sayısı, öğün atlama sıklıkları, atıştırma alışkanlıkları) sorgulanmıştır. Besin tüketim sıklığı kayıt formunda ise beş besin grubunun (süt ve türevleri, et ve türevleri, sebze ve meyve, ekmek ve diğer tahıllar, şeker ve tatlı) tüketim sıklığı incelenmiştir. İstatistiksel analizler IBM SPSS Statistics 21.0 programı ile yapılmıştır. Sonuçlar, $p<0,05$ istatistiksel anlamlılık düzeyinde ve %95 güven aralığında değerlendirilmiştir. BKİ'nin diyabet grubunda (34,03±7,73) hipertansiyon (33,04±6,09) ve hiperlipidemi grubuna göre (30,78±4,61) yüksek olduğu görülmüş, gruplar arasında anlamlı fark saptanmıştır ($p<0,03$). Kırmızı et tüketimi karşılaştırıldığında, diyabet grubunun (%48,4, n=25), hipertansiyon grubu (%34,9, n=20) ve hiperlipidemi grubuna (%34,5, n=19) göre daha fazla kırmızı et tükettiği görülmüş**,** gruplar arasında istatistiksel açıdan anlamlı fark saptanmıştır ($p<0,00$). Yumurta tüketimi karşılaştırıldığında, diyabet (%51,9, n=27) ve hiperlipidemi grubunun (%58,2, n=32) hipertansiyon grubuna göre (%39,5, n=17) daha fazla yumurta tükettiği görülmüş, gruplar arasında istatistiksel açıdan anlamlı bir fark saptanmıştır ($p<0,04$). Süt ve türevleri, diğer et ürünleri, sebze ve meyve, ekmek ve diğer tahıllar ve şeker ve tatlıların tüketim sıklıkları karşılaştırdığında, gruplar arasında anlamlı fark saptanmamıştır ($p>0,05$). Sonuç olarak, çalışmamızda üç grubun beslenme alışkanlıklarının farklı özellikler gösterdiği ortaya konulmuştur. Kronik hastalığı olan bireylerin beslenme alışkanlıklarının karşılaştırılması, uygun hastada uygun beslenme planının oluşturulmasına ve tedavi başarısına katkı sağlayabilir.

Anahtar Kelimeler: Beslenme, Beslenme alışkanlıkları, Diyabet, Hipertansiyon, Hiperlipidemi

1. INTRODUCTION and PURPOSE

Sustaining a healthy life of society depends on the health of the individuals who make it up. The basis of health is based on adequate and balanced nutrition (1). In this direction, adequate, balanced and healthy nutrition is the major factor in maintaining health and sustaining its quality throughout the life, prevention from diseases, increasing treatment efficiency after the occurrence of diseases and thus shortening the duration of treatment (2).

Adequate nutrition is achieved by taking enough energy, nutrients and other bioactive substances that the body requires (3). Balanced nutrition is provided by consuming these nutrients depending on each other and in a balanced manner on meals (3). In the context of adequate and balanced nutrition, the most critical point that has to be kept in mind is to have one of the four basic food groups at each meal. These four basic food groups are classified as milk group, meat group, fruits and vegetables group, and breads and cereals group (4).

Another point that should be considered for adequate, healthy and balanced nutrition is the meals and meal patterns consumed during the day. The number, intervals and content of the main meals and snacks in which nutrients are taken into the body are important for ensuring adequate and balanced nutrition (5). Insufficient intake of energy and nutrients to meet an individual's needs, that is malnutrition, prevents growth and development, and causes health deterioration (6). However, consuming nutrients more than required causes excess energy to be taken into the body. Therefore, the energy consumed more than spent, can accumulate as fat in the body and may have negative effects on health. Excessive food consumption can cause the occurrence of cardiovascular diseases such as obesity, diabetes, hypertension and hyperlipidemia (7).

In many countries, diabetes is in the fifth place among the primary causes of death (8). Type 2 Diabetes Melltus (DM) is the most common type of diabetes worldwide and constitutes 80-90% of all diabetes cases (9). The prevalence of diabetes in adults in our country has been observed to increase up to 13.7% according to Turkey Diabetes Hypertension Obesity and Endocrinology Diseases Prevalence Study-II.(10). The main reasons for this increase are inadequate, unhealthy and unbalanced nutrition, inactive and sedentary lifestyle (10). In addition to medication, medical nutrition therapy is one of the most important factors in controlling Type 2 DM (11).

Cardiovascular diseases are in the first place among the primary causes of death and constitute one third of the deaths (12,13). According to the World Health Organization (WHO) data, 17.9 million people lost their lives due to cardiovascular diseases in 2016 and this figure was found to be 44% of deaths in the world (14). In our country, according to the Turkish Statistical Institute data for 2017, 165.323 people died due to cardiovascular diseases associated with nutrition (15). Hypertension and hyperlipidemia are the risk factors of cardiovascular diseases that reduce the quality of life and are the leading causes of death (13). In both developed and developing countries, hypertension, which the majority of the population suffer from, is one of the most important causes of mortality and morbidity and is seen in 20% of adults (16). According to Chronic Diseases and Risk Factors Survey in Turkey, the prevalence of high LDL (Low Density Lipoprotein) cholesterol is 12.5% and this value is observed 11% for men and 14% for women (17). Studies showed that it is possible to reduce the prevalence of hypertension and hyperlipidemia by improving the dietary quality of individuals (18,19).

Foods are among the one of the factors that affect blood sugar, blood pressure and blood fat levels. Excess intake of saturated fat, trans fat, cholesterol and salt increases the risk of cardiovascular diseases whereas consumption of sufficient vegetables and fruits reduces the risk of cardiovascular diseases (20). Furthermore weight loss in addition to nutrients can also provide regulation of blood sugar levels, blood pressure or blood fats (21).

Acquiring nutritional data of diseases such as diabetes, hypertension and hyperlipidemia, which are often described and the cause of which is not yet fully understood, plays an important role in guiding the selection of the appropriate nutrition plan for the appropriate patient for treatment. Through the examination of nutritional habits, it is passible the cost effective treatments of nutritional diseases as diabetes, hypertension and hyperlipidemia.

The study was started with the following research questions.

1. What are the meal patterns and dietary habits of individuals who were diagnosed with diabetes, hypertension and hyperlipidemia?

2. Are the dietary habits of individuals who were diagnosed with diabetes, hypertension and hyperlipidemia different from each other?

In this study it was aimed to compare nutritional habits of individuals diagnosed with diabetes, hypertension and hyperlipidemia who applied to the diet polyclinic in a private hospital. At the end of the study, it is expected to determine whether the dietary habits of three groups of patients diagnosed with diabetes, hypertension and hyperlipidemia are different as well as to determine the food consumption status of individuals who suffer from these diseases. It is believed that this study is important as it is a study examining the comparison of dietary habits of patients with diabetes, hypertension and hyperlipidemia concurrently. These data which will be obtained may lead to new studies and may also contribute to the selection of an appropriate nutrition plan for the treatment of diabetes, hypertension and hyperlipidemia.

2. LITERATURE REVIEW

2.1. Nutrition and Its Importance

Nutrition is the intake of the necessary nutrients for the body (22). In scientific sources, various definitions of nutrition are made that are similar to each other which draw attention to different aspects. In some of these scientific sources, nutrition is defined as the intake of all the nutrients required for the growth of the body, renewal and functioning of the tissues in sufficient quantity and in the required ratio (23), as the taking and consuming foods to perform vital functions such as growth and development, reproduction and doing physical activities (24) and as the use of food and nutrients in the body (25). Nutrition is defined by Zimmerman as all of the processes that cover how organisms use and metabolize nutrients throughout their entire life (26) and Day describes nutrition as cofactors required for energy and metabolism obtained by the nutrient source for the normal structure and function of cells, tissues, organs and the whole body (27). On the other hand, nutrition is defined by the World Health Organization briefly as the intake of nutrients according to the diet the body needs (28). Based on different definitions, nutrition can be defined as taking the physiologically necessary nutrients into the body in sufficient amount and in appropriate time, and a behavior that needs to be done consciously to maintain and enhance the health and improve the quality of life (29). This behavior should be maintained at every stage of the life cycle (30).

Human health is mainly affected by two factors. These are genetic and environmental factors. Genetic factors are inherent traits inherited from the family to the individual. Environmental factors affecting health are the nutritional status of the individual, the place of residence, physical environment, education and cultural opportunities (31). Nutritional status of the individual has an important role among these factors. Therefore, the concept of nutrition and health is in a nested relationship with each other (32,33). Nutrition affects all age ranges, disease status and healthy life from birth to death (25).

If nutrients are not taken up as much as the body needs, malnutrition develops as there is not enough energy for the body. Unbalanced nutritional status occurs as a result of not receiving every nutrient with wrong food selection (24). Unhealthy eating habits cause an increase in diseases such as obesity, weakness, cardiovascular diseases, diabetes and hypertension (34). Therefore, adequate and balanced nutrition is essential to prevent chronic diseases related to nutrition and to live healthy.

2.2. Food Groups

For a healthy diet, each nutrient should be taken in a balanced manner and adequate amount. Nutritional requirements of individuals vary depending on age, gender, height, body weight and metabolic and physical activity (35). Therefore, each society should establish its own standard of energy and nutrients. The United States Department of Agriculture (USDA) issued a Food Pyramid in 1992 to protect the health of its people and to provide their nutritional requirements in a way that they will stay away from diseases. The Food Pyramid prepared by the USDA is a guideline that shows how much food should be consumed by each food group everyday (36). In our country, "Healthy Nutrition and Physical Activity Pyramid" has been established in order to emphasize the importance of physical activity with nutritional recommendations. Healthy Nutrition and Physical Activity Pyramid in Turkey includes the amount of portions to be consumed daily from each food group, nutrients that need to be increased and reduced in consumption and the activities recommended to be performed by adults every day. Healthy Nutrition and Physical Activity Pyramid consists of four levels. The cereal group foods (bread, pasta, rice, bulgur, etc.), which are the main source of food and which are important in meeting the energy needs, are located in the lowest and widest part of the nutrition section of the pyramid (37). Since vegetables and fruits are rich in carbohydrates, vitamins, minerals, pulp (fiber), water and antioxidant compounds, they are in the same group and are located in the second level of the pyramid (3). Milk, yogurt, cheese group and types of meat (red meat and its products, chicken, fish) eggs and legumes that are rich in protein, iron, zinc, calcium and some B vitamins are included in the same group and are located in the second level from the top of the pyramid (4). In the top and narrowest area of the pyramid, there are foods containing sugar and excess fat that should be consumed less (38).

Each food differs in nutrient content, but the content of some foods are similar and can be considered equivalent. Formation of food groups and determination of the amounts to be consumed daily from these groups was made possible by the initiation of nutritional science studies by scientists (30). Food contents are divided into five groups according to their components. These are the milk and dairy products group, meat-eggs-legumes group, vegetables and fruits group, bread and other cereals group and sugar and sweets group (39).

2.2.1. Milk and Dairy Products Group

This group consists of dairy products such as milk, yogurt and cheese. Cow milk is generally preferred for milk, yogurt and cheese in the world and in our country (40). In addition, milk and yogurt of other animals such as sheep, goats, buffalo, calcium-enriched soy milk, fermented milk product kefir which contains live microorganisms, milky sweets and milk powders are included in this group (37,38).

Milk and dairy products are the main source of macro nutrients such as daily energy, protein, carbohydrate, fat and water (40). It contains many minerals including calcium, magnesium, phosphorus and zinc (25,42). It is also quite rich in vitamins B1, B2, B6, B12 and niacin (25,37).

On average 50-90% of the milk is water. The amount of protein in milk is generally 3-3.5%. Milk is a good source of protein and contains sufficient and balanced amount amino acids that is necessary for the body (3). Milk is composed of 3.5% fat, 5% carbohydrate and 1% minerals (5). Milk is rich in fat types such as saturated fatty acid and cholesterol (42). Lactose which is a type of carbohydrate is found only in milk (3). Furthermore, vitamins stored in fat such as A, D, E and K are also found in milk fat. In addition, vitamin D is very low in unenriched milk (37,38).

Yoghurt is a milk product fermented by two types of lactic acid bacteria (43). Yoghurt is similar to milk in content, but shows differences due to processes applied to milk during yogurt making, ingredients added during production, and changes during bacterial fermentation. 80-86% of yogurt is water, 4-8% protein, 2-8% fat, 2-5% milk sugar, 0.8-1.2% mineral matter and 14-% 20 of them are dry matter (44).

Cheese is a basic fermented milk product obtained by mixing milk with cheese yeast and which is important in adequate and balanced nutrition (3,5). Approximately 10 liters of milk is required to produce about 1 liter of cheese, and whey proteins and water-soluble vitamins are separated from casein, fat and salts during the process (40). Cheese contains 10-30% protein and these protein come from casein. It is the essential amino acids that make cheese important as a nutrient (5). During the production of cheese, 94% of lactose is transferred to whey and the rest is converted to lactic acid. Therefore, cheese is not a carbohydrate source (5,40). The fat content of the cheese varies depending on the fat content in the milk. Cheese contains 20-30% milk fat on average (5). Depending on the fat content in cheese, it contains fat-soluble vitamins such as β-carotene and vitamin E (5,40). In addition, cheese is rich in calcium and phosphorus content. It meets 40-50% of daily needs on average (5).

These foods that are in the milk and dairy products group are important in the prevention of type 2 diabetes, hypertension, cardiovascular diseases and management of body weight in adults (37). Consumption of these foods with low glycemic index reduces the incidence of type 2 diabetes (43). Low-fat milk and dairy products have a blood pressure lowering effect. High-fat milk and dairy products increase blood cholesterol levels. Milk and dairy products have an important role in weight loss and weight control because they contain high quality protein, increase the sense of saturation and thus decrease body fat stores (45). Furthermore, milk and dairy products are effective in reducing body fat mass due to the calcium and vitamin D they contain (42).

The countries with the highest milk consumption in the world are Finland, the Netherlands, Switzerland, Norway and Italy. For the above countries, milk consumption per capita is 375.4 kg, 357.3 kg, 312.2 kg, 262.6 kg and 251.7 kg respectively. In Turkey the milk consumption rate is quite low and per capita milk consumption is 143 kg. The United States (USA) has been in the first place in the consumption of dairy products in last two decades, and in 2009, per capita annual dairy consumption is 255.6 kg. A decline in general in the consumption of dairy products was observed in Turkey between 2000-2004 and dairy product consumption is 140 kg (46).

Milk and dairy products, which have an important role in adequate and balanced nutrition, protection from diseases and treatment of diseases, should be consumed as 3 portions daily in adult individuals (30,37,38).

2.2.2. Meat-Egg-Legumes Group

This group consists of foods such as red meats like beef, sheep and lamb, chicken, fish, eggs, chickpeas, dried beans, lentils, legumes, and meat products such as offal, sausage, salami and soujouk. Furthermore, nuts such as almonds, hazelnuts, walnuts and peanuts are included in this group (3,25,37,38).

The foods included in this group contain protein, carbohydrate, fat, vitamins and minerals in different amounts, which are the basic nutrients for human nutrition (3). The foods in this group are especially the source of good quality protein, minerals such as iron, zinc, phosphorus and magnesium and also vitamins such as B1, B6, B12 and A. Therefore they are rich in terms of pulp (25,37,38).

Meat of bovine and small ruminant animals is defined as red meat and poultry and sea food products as white meat (25,30). 75% of the muscle tissue forming the majority of meat is water (3). Since 18% of meat is protein and contains high biological value protein, it is one of the most important protein sources and fat content varies between 4%

and 15% (3,25). Chicken and turkey meat contains less fat than beef. The fat content of the fish varies between 3-15% on average according to the temperature of the water (sea, lake etc.) and the seasons (3). Fish is especially rich in polyunsaturated omega 3 fatty acids, which have an important role in nutrition (5). Furthermore, high-fat meats contain high levels of cholesterol (25,30,37,38). Fat content is lower in offal than meat. Meat and especially liver are the best sources of B group vitamins. Especially vitamin B12 is found only in foods of animal origin (3,37). The amount of minerals in meat varies between 1-1.8% (3). Meat is rich in phosphorus, sodium, chlorine, magnesium, calcium, zinc, iron and copper. Furthermore, fish are a good source of iodine (3,5,25,30,37,38). The average carbohydrate in meat is about 1% and does not have any importance for human nutrition (3).

Eggs are one of the most nutritious foods with high protein content and bioavailability (47). An egg includes an average of 6 grams of protein, 37 grams of water, 6 grams of fat and very little carbohydrate (5). The fat content of the egg is 33% saturated fat, 16% polyunsaturated fat and the rest is monounsaturated fatty acids (25,30,37). Egg yolk is rich in cholesterol since it contains more fat. However, due to lecithin in the structure of egg yolk, cholesterol raising effect is lower than fatty meats and dairy products (25,37). Eggs are a good source of vitamins A, E and B and contain micronutrients such as iron and selenium (5,25,30,37,47).

Chickpeas, beans, lentils, broad beans, peas, black-eyed peas and soybeans are generally preferred legumes (5,25,30,37,38). The average protein content of legumes varies between 17% and 35%, but their protein quality is low (30,37,38). As carbohydrate, there is starch in the inner part and pulp in the outer part (30,37). Legumes consist of low fat and polyunsaturated fatty acids, thus low cholesterol content. Legumes are a good source of group B vitamins other than vitamin B12 and are rich in calcium, zinc, magnesium and iron minerals (25,30,37,38).

Consumption of unprocessed and processed red meat carries a high risk for the development of type 2 diabetes (48). Furthermore, consumption of meat and meat products causes an increase in blood pressure, whereas fish consumption reduces blood pressure (49). Reducing the consumption of red meat and meat products which have high saturated fat and cholesterol content leads to a positive decrease in blood fats (17). Consuming fish rich in omega-3 fatty acids reduces hyperlipidemia level (19). Egg has a protective effect against diabetes and cardiovascular diseases with its zinc, selenium, amino acids and antioxidant content. However, it is an important risk factor for

individuals with these diseases because of the cholesterol content (50). Legumes which is a source of carbohydrates and with high pulp content play a major role in providing glycemic control in individuals with diabetes (51). Fiber-rich nutrition contributes positively to the treatment of hypertension and hyperlipidemia (49).

The most preferred meat in the world is pork and the meat of poultry (53) which is followed by beef and mutton. Countries with the highest per capita consumption of beef are Uruguay and Argentina. In Turkey, chicken meat is consumed at most, followed by beef. Meat consumption per capita is quite low compared to other countries (52).

In healthy nutrition, meat-egg-legumes group should be consumed 3 portions a day (38). In particular, fish rich in omega 3 should be consumed at least twice a week. Legumes should be included in the nutrition programme 2-3 times a week (37).

2.2.3. Vegetable and Fruit Group

Vegetables and fruits are named as two different food groups due to their importance in adequate and balanced nutrition. However, they have been accepted as a single food group because they have similar nutrient content (37,38). Edible parts of plants such as flowers, leaves, stems, roots or seeds form the group of vegetables and fruits. Vegetables with a high starch content are called starchy vegetables. These are potatoes, Jerusalem artichokes, peas and carrots. Vegetables that do not contain starch are called dark green leaves, red, orange and other vegetables. Some of them are broccoli, spinach, lettuce, black cabbage, purslane, chard, tomato, red pepper, green beans, onion, leek, garlic, zucchini, eggplant. Fruits are classified citrus fruits and the others. Orange, tangerine, grapefruit, lemon, apple, pear, grape, melon, watermelon, strawberry, apricot, cherry and peach are in these two groups (30).

Vegetables and fruits are good sources of water and carbohydrates, which are macro nutrients. They are especially rich in dietary fiber. They contain water-soluble vitamins, minerals and bioactive components (37,38).

The majority of vegetables contain more than 80% water. Especially water content of vegetables such as cucumber, spinach, lettuce, cabbage is more than 90%. Starchy vegetables have a water content of less than 80%. The most common macronutrient in vegetables after water is carbohydrate and it is about 3-18%. The protein and fat content of vegetables is very low and they are rich in dietary fiber. Especially green leafy vegetables contain the highest percentage of dietary fiber. Vegetables are an important source of vitamins and minerals that are micronutrients; They contain some of the

vitamins such as A, C, K and B. Vegetables are also rich in potassium, iron, sodium, calcium, phosphorus and magnesium minerals (3).

The water content of fruits is between 70-95% and contains carbohydrate glucose and fructose at most. 7% of the edible parts of fruit are pulp. Protein and fat content is very low. Fruits are usually the best source of vitamins, especially rich in vitamin C. They contain a large proportion of bioactive components such as carotenoid and flavonoid (3).

Mediterranean diet, which is rich in vegetables and fruits, has positive effects in reducing and treating the risk of type 2 diabetes (53). Furthermore, the Diet Approach for the Prevention of Hypertension (DASH) in which vegetables and fruits rich in pulp, vitamin K, calcium and magnesium are consumed are effective in the treatment of hypertension (54).

According to the United Nations Food and Agriculture Organization (FAO) food consumption table, while fruit consumption in our country was 107 kg / person / year in 2001, it increased by 14% in 2011 to 122.9 kg / person / year, but no change was observed in vegetable consumption (2011). 3).

At least 3 portions of vegetables and 2 portions of fruit should be consumed out of 5 portions of vegetables and fruit group. 2 portions of these vegetables should be from green leafy vegetables. Citrus fruits and those rich in antioxidants should be preferred among the fruits (37,38).

2.2.4. Bread and Cereals Group

Cereals are seeds harvested from wheat, such as wheat, rice, rye, corn, barley, millet and oats (3). Furthermore, flour, bread, pasta, noodles, couscous, bulgur and breakfast cereals obtained from these seeds are included in this group (25).

Grain and cereal products are rich in carbohydrates (pulp, starch). Altough they have protein content it is low in quality. When consumed together with foods such as meat, eggs, legumes and milk, the protein quality of cereals can be improved. In addition, grain and cereals contain some amount of oil. Cereals are also rich in vitamins, minerals and bioactive components. Except vitamin B12, they are a good source of B group vitamins and vitamin E and contain minerals such as iron, magnesium and selenium. Beta-glucan, phenolic acid, phytosterol, flavonoids and carotenoids are biactive components involved in cereals (3,25,37,38).

Bread, which is the most consumed cereal product, is made from white flour, whole grains or mixed whole grains as leavened or unleavened (30,37). In our country, bread is consumed in different types such as yufka, pita, lavash and baslama. Iron, zinc

and copper content and absorption of leavened breads are higher than unleavened breads (30,37).

Rice is the main food consumed by half of the world population and meets the energy needs of many people (55). Its starch content is quite high, and also contains elements such as niacin, phosphorus and iron (55). Bulgur is obtained from wheat. Since it does not lose its nutritional value during processing, it is a good grain source (37). Pasta is mostly made of white flour, and its vitamin and mineral content is quite low (30).

In adequate and balanced nutrition consumption of whole grain products has positive effects on certain diseases. A high amount of whole grains reduces the risk of forming type 2 diabetes by 20-30%. The Mediterranean diet and DASH diet, which emphasize whole grain consumption, provide a reduction in the risk of cardiovascular disease. Oat and oat bran-rich nutrition reduces total cholesterol and LDL cholesterol (3).

Different types and amounts of grain in the world and in Turkey is consumed. Wheat consumption decreased in Australia, Canada and the USA in 2017/18 term whereas increased in Russia, Europe and China, and was also record high in Asia and Africa. Rice consumption is highest in Asian countries. Wheat consumption in our country has been increasing in parallel with the increasing population. In particular, the consumption of bakery products based on bread, bulgur, pasta and other wheat is quite high at 18-19 million tons. Rice consumption also increased from 550 thousand tons to 750 thousand tons between 2000 and 2018 (56).

The recommended amount of portions to be consumed per day in adult individuals of the cereal and cereal products group is 7. However, this number varies depending on individuals' gender, age, body weight and physical activity. Half of the cereal products consumed daily should be met from whole grains (37,38).

2.2.5. Sugar and Sweets

This group consists of sugar, honey, jam, molasses, and also milk, fruit and dough sweets made by adding sugar, honey, jam and molasses (25).

Sugar is obtained from beet or sugar cane. 99.9%of sugar is sucrose. As it is simple sugar, it only gives energy and has no nutritional value: It does not contain protein, vitamins and minerals. It is marketed as granulated, cube and powdered sugar. This sugar, also called additional sugar, is used in the preparation of various foods. It is mostly found in cola, carbonated drinks, fruit juices, cakes, pies, pastry and milk desserts (5,37).

Honey contains fructose and glucose and a small amount of sucrose. Molasses is obtained by boiling and stiffening the grape juice and it is rich in glucose. It is particularly

a good source of calcium and iron. In addition, honey and molasses contain a small amount of vitamin B as opposed to sugar. Another sugary food is jam. Approximately 75% of the jam is carbohydrate. Vitamins are lost in it as it is boiled for a long time (5).

Simple sugar rapidly increases blood sugar in people with diabetes. Therefore, it is inconvenient for people with diabetes to use it. Therefore it poses a risk for hypertension and cardiovascular diseases (37).

The amount of sugar consumption in the world is approximately the amount of production. Sugar consumption increased by 1.5% between 2013-2018. According to TURKSTAT data, while sugar consumption in Turkey was 1,998 tons in 2013, it increased by 13% to 2,500 tons in 2017 (57).

Daily intake of additional sugar should not exceed 10% of the daily energy needed by individuals, except for the sugars present in the structure of foods (37).

2.3. Meals and Meal Patterns in Healthy Nutrition

Healthy, adequate and balanced nutrition plays an effective role in maintaining the physiological balance of the body. The nutrients taken into the body form the building blocks of the cells, meet the energy needs of the tissues and ensure the balanced functioning of metabolism. Meals and meal patterns are of great importance in providing this cycle within the day (30,58).

The concept of meals shows the times of food consumption during the day. Meals are divided into two as main meals and snacks. The main meals are called breakfast, lunch and dinner. The nutrition times among these are snacks which are mid-morning (brunch), afternoon and night snacks. In researches, it has been observed that the most important issue to be considered in nutrition is the balanced distribution of daily food and food groups in three main meals. Research also shows that the most ideal nutrition is consumed by main meals at 4-5 hour intervals. In addition, 2-2,5 hours after each main meal, low-energy content, rich in nutrients and nutrient diversity should be added to the daily nutrition plan (30,58,59).

In sufficient and balanced nutrition, not only the number of main meals and snacks and time intervals but also the content of the meals are important. The more balanced the distribution of nutrients in the meals, the more the metabolism works regularly and especially the blood sugar-insulin balance can be achieved. In order for a healthy individual to be protected from diseases and to perform daily tasks with the highest performance, meals should be composed of foods containing basic food groups (30,58,59).

2.4. Nutrition in Chronic Diseases

2.4.1. Diabetes and Nutritional Therapy in Diabetes

Diabetes Mellitus (DM), as it is called in the medical literature, is a chronic metabolic disease characterized by elevated blood sugar and abnormalities in carbohydrate, protein and fat metabolism as a result of impaired insulin secretion and insulin activity or both. Insulin secreted from the β-cells of the pancreas, which is necessary to meet the body's energy needs and provides storage of excess nutrients, is not produced by individuals with diabetes or the body does not respond to insulin (60).

Diabetes, classified on the basis of the pathological process leading to an increase in blood sugar, is of four clinical types. These are type 1 diabetes, type 2 diabetes, gestational diabetes and other specific types. Type 1 DM is caused by β-cells damage and leads to complete insulin deficiency. Type 2 DM is characterized by insulin resistance and insufficiency of insulin secretion. Gestational diabetes is a type of diabetes that occurs during pregnancy in some women and does not meet the classic definition of diabetes. Another specific type is diabetes, which occurs due to genetic defects in β-cell functions, surgery, drugs, malnutrition, infection, or other diseases (60,61).

Type 2 DM is more common in Asian-African-origin Caucasians and in women. In 2007, the prevalence of diabetes in the USA was 7.8%. According to TURDEP-I and TURDEP-II studies in 1997 and 2010, the prevalence of diabetes increased by 90% over a 12-year period and the prevalence of diabetes increased from 7.2% to 13.7% on average. According to WHO, the number of people with diabetes in 2030 was stated to be 366 million (60,61).

The main treatment of diabetes consists of drug therapy, healthy nutrition and physical activity and complementary strategies. Oral antidiabetic drugs are used for medical treatment in type 2 DM. These drugs have characteristics such as insulin secreting, insulin sensitizing and delaying glucose absorption from the intestine. Insulin therapy is preferred when oral antidiabetic drugs cannot regulate blood glucose. Insulin therapy is a replacement therapy. It provides individuals to benefit from nutrients by giving insulin to individuals who secrete the necessary amounts of insulin in small amounts or that are never secreted in their bodies. Insulins are generally divided into four as short, fast, medium and long acting insulin. Furthermore, there are mixed insulins obtained from the mixing of short- and medium-acting insulin (62).

Medical nutrition therapy in diabetes is the basis of treatment. Nutritional therapy is necessary primarily to prevent the development of diabetes, then to treat existing

diabetes and to prevent diabetes-related complications. Since the majority of people with type 2 diabetes are obese, the basic principle is to limit energy intake, increase physical activity, control and treat obesity and reduce insulin resistance. In the nutritional treatment of diabetics, simple carbohydrates that increase blood sugar rapidly should be restricted and complex carbohydrates should be included in the diet. Carbohydrates contained in whole grains, vegetables, fruits and low-fat dairy products are good sources of vitamins, minerals, dietary fiber and energy (60). Red meat, chicken, fish and eggs do not contain carbohydrates. They are rich in protein and fat content. Therefore, these foods should be consumed by paying attention to the type and quantity (3). The number and distribution of meals in diabetic individuals to achieve weight management and glycemic control are important components of nutritional therapy. Especially people with type 2 diabetes who can produce sufficient amounts of insulin should consume their food in the form of frequent meals arranged at 4-5 hour intervals instead of consuming 2-3 meals (39).

2.4.2. Hypertension and Nutritional Therapy in Hypertension

In repeated measurements, arterial blood pressure higher than 140/90 mmHg is called hypertension (63). Hypertension, which is characterized by continuous high blood pressure, is a systemic disease and causes serious complications. Untreated hypertension increases the occurrence of diseases such as cardiovascular diseases and kidney diseases (63).

Blood pressure is classified according to the values obtained from repeated office measurements. Blood pressure values below 120/80 mmHg are considered normal in adults. Increased blood pressure is defined as systolic blood pressure of 120-129 mmHg and/or diastolic blood pressure of 80-89 mmHg. Hypertension is categorized as having a systolic blood pressure higher than 140 mmHg and/or diastolic blood pressure higher than 90 mmHg (63).

High blood pressure is an important risk factor for all diseases (63). According to WHO, hypertension is the third most lethal disease in the world. In the National Health and Nutrition Research (NHANES) study conducted between 1999-2000, 27% of adult Americans were found to be hypertension and 31% prehypertensive. According to the Turkish Hypertension Prevalence Study conducted in 2012 in Turkey, the prevalence of hypertension is 30.3% (60).

The main treatment of hypertension consists of non-pharmacological and pharmacological methods involving major lifestyle changes. In the treatment of

hypertension, four major groups of antihypertensive drugs are used as a single or combination at the beginning and during the treatment (63).

Medical nutrition therapy in hypertension significantly reduces blood pressure (54). There is a relationship between body weight and blood pressure. Weight loss provided by preventing the intake of energy more than necessary is the first choice of treatment for people with hypertension. A 10% weight gain increases systolic blood pressure by 7 mmHg, while a 1 kg loss in weight reduces systolic blood pressure by 0.3-0.4 mmHg (60). Another treatment option is the DASH diet plan. The DASH diet supports the consumption of vegetables, fruits, low-fat dairy products, cereals, fish and nuts. This diet is also an attempt to reduce red meat, sweets, sugary drinks, saturated fat and cholesterol intake (64).

2.4.3. Hyperlipidemia and Nutritional Therapy in Hyperlipidemia

Hyperlipidemia is a condition in which one or more of the lipoproteins in the blood is higher than the optimal level of 200 mg / dl due to lipid metabolism disorder. Hyperlipidemia is divided into two subgroups as primary and secondary. While primary hyperlipidemia occurs due to genetic causes, secondary hyperlipidemia occurs due to another disease or condition (17).

Hyperlipidemia can also be classified as hypercholesterolemia, hypertriglyceremia or the presence of two conditions at the same time according to high serum types. Cholesterol is a type of lipid in the form of a fat-like wax that is the basic building block of the cell membrane. It can be synthesized by the body and taken by diet as well. Cholesterol is carried in the blood by lipoprotins consisting of fat and protein. Lipoproteins are classified as chylomicrons, very low density lipoprotein (VLDL), medium density lipoprotein (IDL), low density lipoprotein (LDL) and high density lipoproteins (HDL) (17,65). LDL and HDL are important lipoproteins especially in terms of cardiovascular diseases. LDL carries cholesterol from the liver to the cells in the body. HDL, on the other hand, collects excess cholesterol in the blood and transports it to the liver for disintegration. Therefore, high LDL leads to the accumulation of cholesterol in the vessel wall and increases the risk of cardiovascular disease. Elevated HDL in the blood reduces the risk of cardiovascular disease because it removes cholesterol accumulated in the vessels. However HDL cannot be taken with diet and can only be produced by the body (17,60).

Impaired lipid metabolism is the most important risk factor for the incidence of cardiovascular disease due to vascular occlusion. According to WHO data, the prevalence

of high cholesterol in adults is 39%. In 2016, 44% of deaths associated with noncommunicable diseases worldwide are due to cardiovascular diseases (66). In our country, according to 2017 TurkStat data, the percentage of those who died from circulatory system diseases is 39.7 (15).

Hyperlipidemia includes drug and non-drug therapy approaches. Statins in drug therapy are an important group used in lipid reducing therapy. Bile binders, cholesterol absorption inhibitors, fibric acid derivatives and nicotinic acid are also involved in pharmacological therapy. In recent years, studies have been initiated on new drugs and gene therapies for individuals who cannot reach the target values with existing drugs (67).

In non-drug therapy of hyperlipidemia, regulation of nutritional habits at every stage of medical nutritional therapy is extremely important (17). Foods containing saturated fatty acids, fats found in animal nutrients and fats such as butter, tail fat and inner fat are rich in cholesterol (60). Instead of cholesterol-rich foods, foods rich in monounsaturated fatty acids such as olives, olive oil, nuts, hazelnut oil and fish, and foods rich in polyunsaturated fatty acids such as omega-6, plant and vegetable oils, omega-3, green plants, fish and fish oil should be incorporated in the content of diet (60). Furthermore, the diet inspired by the Mediterranean diet is preferred in the therapy of hyperlipidemia. This type of diet is characterized by regular consumption of vegetables, fruits and grains, moderate consumption of fish and poultry, and less consumption of dairy products, red meat, processed meat and very little sweet (67).

As a result, when the characteristics of diabetes, hypertension and hyperlipidemia diseases are examined, medical nutritional therapy emerges in terms of prevention and treatment of these three diseases. Carbohydrates play a more important role in the nutritional therapy of people with diabetes than in those with hypertension and hyperlipidemia. Since simple carbohydrates (honey, sugar, fruit) increase blood sugar rapidly, they should be removed from the dietary content of diabetic individuals and complex carbohydrates (cereals, legumes, vegetables) should be added instead. Since red meat, chicken, fish and eggs do not contain carbohydrates, it does not play an important role in the nutritional therapy of diabetes, but plays an important role in the nutritional therapy of hypertension and hyperlipidemia. Although these foods do not contain carbohydrates, they are rich in protein and fat content. In particular, red meat with a high content of saturated fatty acids contain high levels of cholesterol. Therefore, it is important to pay attention to the amount of red meat in nutritional therapy for hyperlipidemia. Nutritional therapy of diabetes, hypertension and hyperlipidemia

diseases should include a diet model that supports regular consumption of vegetables, fruits, cereals, legumes, nuts, fish, low-fat milk and milk products and limits the consumption of red meat rich in sugar, sweet, saturated fat and cholesterol.

3. MATERIALS AND METHODS

3.1. The Location and The Timeframe of The Study

The research was conducted in the Adatıp Hospital Diet Policlinic in İstanbul between 16 February 2018 and 16 July 2018.

3.2. Sampling of The Study

The population of the study is consisted of individuals who applied to Istanbul Private Adatıp Hospital Diet Policlinic between 16 February 2018 and 16 July 2018. The sample of the study is consisted of 150 patients with diabetes, hypertension and hyperlipidemia diagnosed by the physician, aged between 18-70, who signed the informed consent form and answered the questions completely.

3.3. Data Collection

3.3.1. Data Collection Tools

The information forms, as the data collection tools of the study, were filled out by the researcher face-to-face during working hours (09.00-17.00). Information Form (APPENDIX-1) and Food Consumption Frequency Registration Form (APPENDIX-2) were conducted those who accepted to participate in the study. The Information Form consists of 27 questions prepared by the researcher based on the literature. In the Information Form, questions were asked to determine the sociodemographic information and nutritional habits of the participants.

In the section related sociodemographic information, the participants were asked questions to determine their individual characteristics such as age, gender, marital status, educational background, smoking and alcohol consumption, medical history, medication and exercise status.

In order to examine the nutritional habits of the individuals, the participants were asked about the number of main meals and snacks as daily consumption, the status and reasons of skipping main meals/snacks, snacking habits, preferences eating out and water consumption.

Anthropometric measurements of the individuals who accepted to participate in the study were analyzed by Inbody 770 professional body analyzer. Inbody 770 is a device that performs bioelectrical impedance analysis. Seca 220 1714008 model Stadiometer was used for height measurement.

For the food consumption frequency, 28 types of food including milk and its derivatives, meat and its derivatives, vegetables and fruits, bread and other cereals, sugar and sweets were asked. The consumption frequency of each of these foods by individuals is questioned with the choices of "every day", "every other day", "1-2 times a week", "once in 15 days", "once a month" and "I do not consumption".

3.4. Statistical Analysis

IBM SPSS Statistics 21.0 program was used for statistical analysis. Descriptive statistics were expressed as mean, standard deviation, minimum and maximum values for continuous variables, while categorical variables were expressed as numbers (n) and percent (%). Differences between groups for numerical variables of more than two samples were analyzed by One Way Analysis of Variance (ANOVA) and Kruskal Wallis test. Pearson Chi-Square and Fisher's Exact tests were used to determine the relationship between categorical variables. The results were evaluated at $p < 0.05$ statistical significance level and 95% confidence interval.

3.5. Ethical Considerations

Before the data collection process, an application was made to Yeditepe University Clinical Research Ethics Committee and the Ethics Committee Approval dated 15.02.2018 and numbered 37068608-6100-15-1451 was obtained (APPENDIX-3). After the approval of the Ethics Committee, a research permission was obtained from Adatıp Hospital, where the study was conducted (APPENDIX-4). Within the scope of the study, participants were informed about the study and informed consent forms were signed (APPENDIX-5).

4. RESULTS

Table 4.1 shows the distribution of demographic data of the patient groups with diabetes, hypertension and hyperlipidemia included in our study. Considering demographic data the mean age of the diabetes group, the hypertension group and the hyperlipidemia group was observed as 38.71 ± 14.60, 43.05 ± 12.25 and 36.49 ± 8.73 respectively. The study included 34 females and 18 males in the diabetes group, 31 females and 12 males in the hypertension group, and 39 females and 16 males in the hyperlipidemia group. When the marital status of the patients were compared, 67.3% (n = 35) of diabetic patients, 90.7% (n = 39) of hypertension patients and 78.2% (n = 43) of hyperlipidemia patients were married and there was a statistically significant difference between the groups (p <0.00, x^2=13.33). When compared in terms of educational status, high school graduates in each group (n = 30, 57.7%, n = 18, 41.9%, n = 37, 67.3%, respectively) were observed to be more than undergraduate graduates (n=14, 26.9%, n=9, 20.9%, n = 15, 27.3%, respectively) and there was a statistically significant difference between the groups (p <0.01, x^2 = 13.67). BMI was higher in the diabetes group (34.03 ± 7.73) compared to the hypertension (33.04 ± 6.09) and hyperlipidemia group (30.78 ± 4.61), and a significant difference was found between the groups (p <0.03). Looking at the medication, 88.5% (n = 46) of diabetes patients, 88.4% (n = 38) of hypertension patients and 5.5% (n = 3) of hyperlipidemia patients were taking medication and a statistically significant difference was observed between the groups (p <0.00, x^2 = 98.43).

Table 4.1. Comparison of Demographic Characteristics of Groups

Demographic Characteristics		Diabetes (n=52)	Hypertension (n=43)	Hyperlipidemia (n=55)	p-value
Age (Years)		38.71±14.60	43.05±12.25	36.49±8.73	0.08[b]
Gender	Female	n=34 (65.4%)	n=31 (72.1%)	n=39 (70.9%)	0.74[c]
	Male	n=18 (34.6%)	n=12 (27.9%)	n=16 (29.1%)	
Marital Status	Married	n=35 (67.3%)	n=39 (90.7%)	n=43 (78.2%)	**0.00**[*,d]
	Single	n=12 (23.1%)	n=2 (4.7%)	n=12 (21.8%)	
	Widow / Widower	n=5 (9.6%)	n=2 (4.7%)	n=0 (0.0%)	
Education	Primary school	n=7 (13.5%)	n=11 (25.6%)	n=1 (1.8%)	**0.00**[*,c]
	High school	n=30 (57.7%)	n=18 (41.9%)	n=37 (67.3%)	
	Associate Degree	n=1 (1.9%)	n=3 (7.0%)	n=1 (1.8%)	
	University	n=14 (26.9%)	n=9 (20.9%)	n=15 (27.3%)	
	Master / Doctor	n=0 (0.0%)	n=2 (4.7%)	n=1 (1.8%)	
BMI[+] (kg/m^2)		34.03±7.73	33.04±6.09	30.78±4.61	**0.03**[*,b]
Medication	Yes	n=46 (88.5%)	n=38 (88.4%)	n=3 (5.5%)	**0.00**[*,c]
	No	n=6 (11.5%)	n=5 (11.6%)	n=52 (94.5%)	

([+]**BMI:** Body Mass Index)

n = Number of samples.

The numerical variables in the table are indicated as numbers (n) and $\overline{X}$±SD, and categorical variables as numbers (n) and percentages (%). [*]The values shown in bold in the table are statistically significant (p <0.05). Differences among groups, for numerical variables more than two samples were analyzed by [a] ANOVA and [b] Kruskal Wallies test, whereas [c] Person chi-square (x^2) and [d] Fisher Exact test for categorical variables.

Distribution of Meal Skipping Frequency belonging to diabetes, hypertension and hyperlipidemia groups is shown in Table 4.2. When the number of main meals were compared, no statistically significant difference was found between the groups (p <0.28, x^2= 2.52). However, it was observed that 55.8% (n = 29) of the diabetes group, 65.1% (n = 28) of the hypertension group and 49.1% of the hyperlipidemia group consumed 2 meals. When the number of snacks were compared, no statistically significant difference was found (p <0.27, x^2 = 5.09), but the number of individuals in each group consuming 2 meals were observed higher than (n = 35, 67.3%, n = 30, 69.8%, n = 40, 72.7% respectively) the ones consuming 1 meal (n = 2, 3.8%, n = 5, 11.6%, n = 1, 1.8%, respectively) and consuming 3 meals (n = 15, 28.8%, n = 8, 18.6%, n = 14, 25.5%, respectively).

Table 4.2. Distribution of Meal Numbers of Groups

Meal	Meal Numbers	Diabetes (n=52)	Hypertension (n=43)	Hyperlipidemia (n=55)	p-value
Main Meal	2 meal	n=29 (55.8%)	n=28 (65.1%)	n=27 (49.1%)	0.28[a]
	3 meal	n=23 (44.2%)	n=15 (34.9%)	n=28 (50.9%)	
Snacks	1 meal	n=2 (3.8%)	n=5 (11.6%)	n=1 (1.8%)	0.27[b]
	2 meal	n=35 (67.3%)	n=30 (69.8%)	n=40 (72.7%)	
	3 meal	n=15 (28.8%)	n=8 (18.6%)	n=14 (25.5%)	

n = Number of samples.

The categorical variables in the table are indicated as number (n) and percentage (%). The difference among the groups was analyzed by [a] Person chi-square (x^2) and [b] Fisher's Exact test for categorical variables.

Distribution of Meal Skipping Frequency of Groups is shown in Table 4.3. no statistically significant difference was found between the groups in terms of skipping between main meals and snacks (p <0.24, x^2 = 2.89, p <0.06, x^2= 5.79, respectively).

Table 4.3. Distribution of Meal Skipping Frequency of Groups

Skipped Meal	Skipping Frequency	Diabetes (n=52)	Hypertension (n=43)	Hyperlipidemia (n=55)	p-value
Main Meal	Always	n=23 (44.2%)	n=25 (58.1%)	n=23 (41.8%)	0.23
	Sometimes	n=29 (55.8%)	n=18 (41.9%)	n=32 (58.2%)	
Snacks	Always	n=29 (55.8%)	n=30 (69.8%)	n=25 (45.5%)	0.05
	Sometimes	n=23 (44.2%)	n=13 (30.2%)	n=30 (54.5%)	

n = Number of samples.

The categorical variables in the table are indicated as number (n) and percentage (%). The difference among the groups was analyzed by Person chi-square (x^2) test for categorical variables.

The distribution of meals frequently skipped by groups is shown in Table 4.4. When the frequently skipped main meals were compared, it was observed that the diabetes group skipped breakfast (n = 31, 59.6%) more than the hypertension (n = 13, 30.2%) and hyperlipidemia group (n = 18, 32.7%) and there was a significant difference between the groups statistically (p <0.02, x^2 = 11.3). When the frequently skipped snacks were compared, no statistically significant difference was found (p <0.64, x^2 = 2.48). However it was observed that the highest number of snacks skipped was mid morning (brunch) (n = 32, 61.5%, n = 24, 55.8%, n = 27, 49.1%, respectively) whereas the lowest number of snacks skipped was afternoon (n = 9, 17.3%, n = 7, 16.3%, n = 9, 16.4%, respectively) for each group.

Table 4.4. Distribution of Meals Frequently Skipped by Groups

Meal	Skipped Meal	Diabetes (n=52)	Hypertension (n=43)	Hyperlipidemia (n=55)	p-value
Main Meal	Breakfast	n=31 (59.6%)	n=13 (30.2%)	n=18 (32.7%)	**0.02***
	Lunch	n=17 (32.7%)	n=24 (55.8%)	n=28 (50.9%)	
	Dinner	n=4 (7.7%)	n=6 (14.0%)	n=9 (16.4%)	
Snacks	Mid-morning	n=32 (61.5%)	n=24 (55.8%)	n=27 (49.1%)	0.64
	Afternoon	n=9 (17.3%)	n=7 (16.3%)	n=9 (16.4%)	
	Night	n=11 (21.2%)	n=12 (27.9%)	n=19 (34.5%)	

n = Number of samples.

The categorical variables in the table are indicated as number (n) and percentage (%). *The values shown in bold in the table are statistically significant (p <0.05).The difference among the groups was analyzed by Person chi-square (x^2) test for categorical variables.

The distribution of the reasons for meal skipping of the groups is shown in Table 4.5. When the reasons for skipping main meals were compared, no statistically significant difference was found between the groups (p <0.35, x^2 = 6.73). However, 34.6% (n = 18) of the diabetes group and 34.9% (n = 15) of the hypertension group skipped the main meal because most of them did not desire it, whereas 47.3% (n = 26) of the hyperlipidemia group skipped the main meal to lose weight/maintain their weight. When the reasons for skipping snacks were compared, although there was not significant difference statistically between the groups (p <0.67, x^2 = 4.19), 23.1% (n = 19) of the diabetes group and 41.9% (n = 18) of the hypertension group skipped meals because most of them did not desire it, and 41.8% (n = 23) of the hyperlipidemia group skipped the main meal to lose weight / maintain their weight.

Table 4.5. Distribution of Reasons for Meal Skipping of Groups

Meal	Reasons for Meal Skipping	Diabetes (n=52)	Hypertension (n=43)	Hyperlipidemia (n=55)	p-value
Main Meal	Workload	n=16 (30.8%)	n=14 (32.6%)	n=13 (23.6%)	0.35
	I do not desire	n=18 (34.6%)	n=15 (34.9%)	n=13 (23.6%)	
	Do not eat to lose weight / maintain weight	n=16 (30.8%)	n=14 (32.6%)	n=26 (47.3%)	
	Other	n=2 (3.8%)	n=0 (0.0%)	n=3 (5.5%)	
Snacks	Workload	n=14 (67.3%)	n=10 (23.3%)	n=13 (23.6%)	0.66
	I do not desire	n=19 (23.1%)	n=18 (41.9%)	n=16 (29.1%)	
	Do not eat to lose weight / maintain weight	n=17 (9.6%)	n=15 (30.9%)	n=23 (41.8%)	
	Other	n=2 (3.8%)	n=0 (0.0%)	n=3 (5.5%)	

n = Number of samples.

The categorical variables in the table are indicated as number (n) and percentage (%). The difference among the groups was analyzed by Fisher's Exact test for categorical variables.

The distribution of snack preferences of the groups is shown in Table 4.6. It was seen that 71.2% (n = 37) of the diabetes group, 67.4% (n = 29) of the hypertension group and 72.7% (n = 40) of the hyperlipidemia group had snacking habits. When snacking preferences were compared, there was not significant difference statistically between groups ($p < 0.52$, $x^2 = 1.30$). However, in each group, cake / biscuit / chips (n = 36, 69.2%, n = 25, 58.1%, n = 36, 55.5%, respectively) were the most preferred snacks. Although no statistically significant difference was found between the groups ($p < 0.93$, $p < 0.07$, $p < 0.85$, respectively), it was observed that milk / yoghurt / ayran, soft drinks / juice and carbonated beverages were the less preferred snacks.

Table 4.6. Distribution of Snack Preferences of Groups

Snack Preferences		Diabetes (n=52)	Hypertension (n=43)	Hyperlipidemia (n=55)	p-value
Tea / coffee	Yes	n=16 (30.8%)	n=16 (37.2%)	n=21 (38.2%)	0.69[a]
	No	n=36 (69.2%)	n=27 (62.8%)	n=34 (61.8%)	
Fruits / Fresh vegetables	Yes	n=14 (26.9%)	n=8 (18.6%)	n=14 (25.5%)	0.60[a]
	No	n=38 (73.1%)	n=35 (81.4%)	n=41 (74.5%)	
Carbonated drinks (Cola / soda etc.)	Yes	n=8 (15.4%)	n=5 (11.6%)	n=7 (12.7%)	0.85[a]
	No	n=44 (84.6%)	n=38 (88.4%)	n=48 (87.3%)	
Milk / yoghurt / ayran	Yes	n=5 (9.6%)	n=3 (7.0%)	n=5 (9.1%)	0.93[b]
	No	n=47 (90.4%)	n=40 (93.0%)	n=50 (90.9%)	
Cakes / biscuits / chips etc.	Yes	n=36 (69.2%)	n=25 (58.1%)	n=36 (55.5%)	0.52[a]
	No	n=16 (30.8%)	n=18 (41.9%)	n=19 (34.5%)	
Soft drinks / juice	Yes	n=3 (5.8%)	n=7 (16.3%)	n=2 (3.6%)	0.07[b]
	No	n=49 (94.2%)	n=36 (83.7%)	n=53 (96.4%)	
Nuts	Yes	n=14 (26.9%)	n=14 (32.6%)	n=17 (30.9%)	0.82[a]
	No	n=38 (73.1%)	n=29 (67.4%)	n=38 (69.1%)	
Other	Yes	n=16 (30.8%)	n=13 (37.2%)	n=14 (25.5%)	0.80[a]
	No	n=36 (69.2%)	n=30 (62.8%)	n=41 (74.5%)	

n = Number of samples.

The categorical variables in the table are indicated as number (n) and percentage (%). The difference among the groups was analyzed by [a] Person chi-square (x^2) and [b] Fisher's Exact test for categorical variables.

Distribution of Frequencies and Preferences of Groups Eating Out are shown in Table 4.7. When the frequency of eating out was compared, no statistically significant difference was found between the groups (p <0.53, x^2 = 8.99). However, diabetes, hypertension and hyperlipidemia groups (n = 19, 36.5%, n = 16, 37.5%, n = 25, 45.5%, respectively) were found to eat out 1-2 times a week at most. When the eating out preferences were compared, no statistically significant difference was found between the groups (p <0.75, x^2 = 0.55). However, it was observed that 42.3% (n = 22) of the diabetes group, 34.9% (n = 15) of the hypertension group and 38.2% (n = 21) of the hyperlipidemia group preferred to eat kebab /doner /wrap out. It was observed that 78.8% (n = 41) of the diabetes group, 88.4% (n = 38) of the hypertension group and 94.5% (n = 52) of the hyperlipidemia group preferred to eat pita / lahmacun / pancake out and there was a significant difference between the groups statistically (p <0.04, x^2 = 6.01). Although

there was not significant difference between the groups statistically (p <1.00, p <0.66, p <1.00, respectively), juicy home dishes, salads and other dishes were less preferred.

Table 4.7. Distribution of Frequencies and Preferences of Groups Eating Out

Eating Outside Frequencies		**Diabetes (n=52)**	**Hypertension (n=43)**	**Hyperlipidemia (n=55)**	**p-value**
Never		n=3 (5.8%)	n=4 (9.3%)	n=4 (7.3%)	0.53[b]
Everyday		n=8 (15.4%)	n=9 (20.9%)	n=8 (14.5%)	
Every other day		n=7 (13.5%)	n=1 (2.3%)	n=8 (14.5%)	
1-2 times a week		n=19 (36.5%)	n=16 (37.2%)	n=25 (45.5%)	
Once in 15 days		n=2 (3.8%)	n=1 (2.3%)	n=2 (3.6%)	
Once a month		n=13 (25.0%)	n=12 (27.9%)	n=8 (14.5%)	
Eating Out Preferences					
Fast food (hamburger, pizza, etc.)	Yes	n=11 (21.2%)	n=3 (7.0%)	n=7 (12.7%)	0.13[a]
	No	n=41 (78.8%)	n=40 (93.0%)	n=48 (87.3%)	
Kebab / doner / wrap	Yes	n=22 (42.3%)	n=15 (34.9%)	n=21 (38.2%)	0.75[a]
	No	n=30 (57.7%)	n=28 (65.1%)	n=34 (61.8%)	
Pita bread / lahmacun / pancake (gozleme)	Yes	n=11 (21.2%)	n=5 (11.6%)	n=3 (5.5%)	**0.04[*,a]**
	No	n=41 (78.8%)	n=38 (88.4%)	n=52 (94.5%)	
Grill dishes	Yes	n=21 (40.4%)	n=17 (39.5%)	n=23 (41.8%)	0.97[a]
	No	n=31 (59.6%)	n=26 (60.5%)	n=32 (58.2%)	
Juicy home cooking	Yes	n=2 (3.8%)	n=2 (4.7%)	n=2 (3.6%)	1.00[b]
	No	n=50 (96.2%)	n=41 (95.3%)	n=53 (96.4%)	
Salad types	Yes	n=3 (5.8%)	n=4 (9.3%)	n=6 (10.9%)	0.66[b]
	No	n=49 (94.2%)	n=39 (90.7%)	n=49 (89.1%)	
Other	Yes	n=1 (1.9%)	n=1 (2.3%)	n=1 (1.8%)	1.00[b]
	No	n=51 (98.1%)	n=42 (97.7%)	n=54 (98.2%)	

n = Number of samples.
The categorical variables in the table are indicated as number (n) and percentage (%). [*]The values shown in bold in the table are statistically significant (p <0.05). The difference among the groups was analyzed by [a] Person chi-square (x^2) and [b] Fisher's Exact test for categorical variables.

Distribution of Milk / Milk Derivatives Consumption Frequencies of Groups is shown in Table 4.8. There was no significant difference between the groups statistically (p <0.19, x^2= 13.06). However it was observed that 28.8% (n = 15) of the diabetes group, 16.3% (n = 7) of the hypertension group and 30.9% (n = 17) of the hyperlipidemia group consumed whole-fat milk daily. When semi-skimmed and skimmed milk consumption were compared, although there was no significant difference between the groups statistically (p <0.30, x^2 = 10.89, p <0.68, x^2 = 5.78, respectively), semi-skimmed and skimmed milk consumption was lower than full-fat milk consumption. When whole-fat and non-fat yogurt consumption are compared, although no significant difference was found between the groups statistically (p <0.27, x^2 = 8.73, p <0.22, x^2= 8.08, respectively), it was observed that while each of the diabetes, hypertension and hyperlipidemia groups consumed whole-fat yogurt daily at most (n = 28, 53.8%, n = 20, 46.5%, n = 35, 63.6%, respectively) non-fat yogurt was not consumed at most (n = 34, 65.4% n = 28, 65.1%, n = 35, 63.6%, respectively). When cheese consumption was compared, although there was no significant difference between the groups statistically (p <0.23, x^2 = 9.82), it was observed that 44.2% (n = 23) of diabetes group, 41.9% (n = 18) of hypertension group and 52.7% (n = 29) of hyperlipidemia group consumed cheese daily. Although there was no significant difference between the groups statistically (p <0.75, x^2 = 6.85), it was observed that in each group of diabetes, hypertension and hyperlipidemia, buttermilk (n = 24, 46.2%, n = 21, 48.8%, n = 29, 52.7%) was consumed 1-2 times a week at most.

Table 4.8. Distribution of Milk / Milk Derivatives Consumption Frequencies of Groups

Food	Frequency	Diabetes (n=52)	Hypertension (n=43)	Hyperlipidemia (n=55)	p-value
Milk (whole fat)	Everyday	n=15 (28.8%)	n=7 (16.3%)	n=17 (30.9%)	0.19
	Every other day	n=1 (1.9%)	n=0 (0.0%)	n=4 (7.3%)	
	1-2 times a week	n=8 (15.4%)	n=15 (34.9%)	n=13 (23.6%)	
	Once in 15 days	n=6 (11.5%)	n=4 (9.3%)	n=5 (9.1%)	
	Once a month	n=10 (19.2%)	n=4 (9.3%)	n=5 (9.1%)	
	I do not consume	n=12 (23.1%)	n=13 (30.2%)	n=11 (20.0%)	
Milk (semi-skimmed)	Everyday	n=1 (1.9%)	n=1 (2.3%)	n=2 (3.6%)	0.30
	Every other day	n=0 (0.0%)	n=1 (2.3%)	n=0 (0.0%)	
	1-2 times a week	n=6 (11.5%)	n=11 (25.6%)	n=10 (18.2%)	
	Once in 15 days	n=4 (7.7%)	n=0 (0.0%)	n=3 (5.5%)	
	Once a month	n=8 (15.4%)	n=2 (4.7%)	n=6 (10.9%)	
	I do not consume	n=33 (63.5%)	n=28 (65.1%)	n=34 (61.8%)	
Milk (skimmed)	Everyday	n=1 (1.9%)	n=2 (4.7%)	n=0 (0.0%)	0.68
	Every other day	n=0 (0.0%)	n=0 (0.0%)	n=0 (0.0%)	
	1-2 times a week	n=5 (9.6%)	n=7 (16.3%)	n=8 (14.5%)	
	Once in 15 days	n=4 (7.7%)	n=2 (4.7%)	n=2 (3.6%)	
	Once a month	n=8 (15.4%)	n=3 (7.0%)	n=8 (14.5%)	
	I do not consume	n=34 (65.4%)	n=29 (67.4%)	n=37 (67.3%)	
Yoghurt (whole fat)	Everyday	n=28 (53.8%)	n=20 (46.5%)	n=35 (63.6%)	0.27
	Every other day	n=8 (15.4%)	n=9 (20.9%)	n=11 (20.0%)	
	1-2 times a week	n=13 (25.0%)	n=14 (32.6%)	n=9 (16.4%)	
	Once in 15 days	n=0 (0.0%)	n=0 (0.0%)	n=0 (0.0%)	
	Once a month	n=1 (1.9%)	n=0 (0.0%)	n=0 (0.0%)	
	I do not consume	n=2 (3.8%)	n=0 (0.0%)	n=0 (0.0%)	
Yogurt (not fat)	Everyday	n=0 (0.0%)	n=0 (0.0%)	n=0 (0.0%)	0.22
	Every other day	n=0 (0.0%)	n=0 (0.0%)	n=0 (0.0%)	
	1-2 times a week	n=4 (7.7%)	n=10 (23.3%)	n=10 (18.2%)	
	Once in 15 days	n=6 (11.5%)	n=2 (4.7%)	n=2 (3.6%)	
	Once a month	n=8 (15.4%)	n=3 (7.0%)	n=8 (14.5%)	
	I do not consume	n=34 (65.4%)	n=28 (65.1%)	n=35 (63.6%)	
Cheese	Everyday	n=23 (44.2%)	n=18 (41.9%)	n=29 (52.7%)	0.23
	Every other day	n=9 (17.3%)	n=8 (18.6%)	n=13 (23.6%)	
	1-2 times a week	n=15 (28.8%)	n=15 (34.9%)	n=7 (12.7%)	
	Once in 15 days	n=0 (0.0%)	n=0 (0.0%)	n=0 (0.0%)	
	Once a month	n=1 (1.9%)	n=0 (0.0%)	n=0 (0.0%)	
	I do not consume	n=4 (7.7%)	n=2 (4.7%)	n=6 (10.9%)	
Ayran	Everyday	n=5 (9.6%)	n=3 (7.0%)	n=5 (9.1%)	0.75
	Every other day	n=8 (15.4%)	n=7 (16.3%)	n=8 (14.5%)	
	1-2 times a week	n=24 (46.2%)	n=21 (48.8%)	n=29 (52.7%)	
	Once in 15 days	n=7 (13.5%)	n=6 (14.0%)	n=7 (12.7%)	
	Once a month	n=5 (9.6%)	n=6 (14.0%)	n=2 (3.6%)	
	I do not consume	n=3 (5.8%)	n=0 (0.0%)	n=4 (7.3%)	

n = Number of samples.
The categorical variables in the table are indicated as number (n) and percentage (%). The difference among the groups was analyzed by Fisher's Exact test for categorical variables.

Distribution of consumption frequency of meat and meat derivatives of groups is shown in Table 4.9. When red meat consumption is compared, it was observed that 48.4% (n = 25) of the diabetic group consumed red meat daily, whereas 34.9% (n = 20) of the hypertension group consumed 1-2 times a week and 34.5% of the hyperlipidemia group (n = 19) consumed every other day and a statistically significant difference was found between the groups (p <0.00, x^2 = 20.4). When chicken and fish consumption were compared, there was no significant difference statistically. (p <0,16, x^2 = 13,11, p <0,87, x^2 = 5,97, respectively), However, it was observed that in each group, chicken (n = 26, 50%, n = 24 respectively) , 55.8%, n = 20, 36.4%) was consumed 1-2 times a week, while the fish (n = 20, 38.5%, n = 20, 46.5%, n = 20, 36.4%, respectively) was consumed once a month at most. When egg consumption was compared, it was observed that 51.9% (n = 27) of the diabetes group and 58.2% (n = 32) of the hyperlipidemia group consumed eggs daily whereas 39.5% (n = 17) of the hypertension group consumed 1-2 times a week, and a statistically significant difference was found between groups (p <0.04, x^2= 13.63). When the offal, salami, sausage and soujouk consumption were compared, no statistically significant difference was found (p <0.58, x^2= 8.32, p <0.82, x^2= 6.01, respectively). However each one of salami, sausage and soujouk were consumed by individuals in diabetes, hypertension and hyperlipidemia groups at most 1-2 times a week (n = 17, 32.7%, n = 15, 34.9%, n = 20, 36.4% respectively). When consumption of legumes were compared, no significant difference was found between the groups statistically (p <0.91, x^2 = 5.43). However it was observed that 59.6% (n = 31) of diabetes group, 67.4% (n = 29) of hypertension group and 58.2% (n = 32) of hyperlipidemia group consumed legumes 1-2 times a week.

Table 4.9. Distribution of Consumption Frequencies of Meat and Meat Derivatives of Groups

Food	Frequency	Diabetes (n=52)	Hypertension (n=43)	Hyperlipidemia (n=55)	p-value
Red meat	Everyday	n=25 (48.4%)	n=12 (16.3%)	n=17 (30.9%)	**0.00***
	Every other day	n=3 (5.8%)	n=8 (9.3%)	n=19 (34.5%)	
	1-2 times a week	n=19 (36.5%)	n=20 (34.9%)	n=16 (29.1%)	
	Once in 15 days	n=2 (3.8%)	n=1 (9.3%)	n=2 (3.6%)	
	Once a month	n=2 (3.8%)	n=0 (0.0%)	n=0 (0.0%)	
	I do not consume	n=1 (1.9%)	n=2 (30.2%)	n=1 (1.8%)	
Chicken	Everyday	n=8 (15.4%)	n=2 (4.7%)	n=6 (10.9%)	0.16
	Every other day	n=10 (19.2%)	n=11 (25.6%)	n=23 (41.8%)	
	1-2 times a week	n=26 (50.0%)	n=24 (55.8%)	n=20 (36.4%)	
	Once in 15 days	n=1 (1.9%)	n=1 (2.3%)	n=2 (3.6%)	
	Once a month	n=3 (5.8%)	n=1 (2.3%)	n=0 (0.0%)	
	I do not consume	n=4 (7.7%)	n=4 (9.3%)	n=4 (7.3%)	
Fish	Everyday	n=1 (1.9%)	n=0 (0.0%)	n=0 (0.0%)	0.87
	Every other day	n=0 (0.0%)	n=0 (0.0%)	n=2 (3.6%)	
	1-2 times a week	n=10 (19.2%)	n=8 (18.6%)	n=13 (23.6%)	
	Once in 15 days	n=7 (13.6%)	n=4 (9.3%)	n=8 (14.5%)	
	Once a month	n=20 (38.5%)	n=20 (46.5%)	n=20 (36.4%)	
	I do not consume	n=14 (26.9%)	n=11 (25.6%)	n=12 (21.8%)	
Eggs	Everyday	n=27 (51.9%)	n=14 (32.6%)	n=32 (58.2%)	**0.04***
	Every other day	n=9 (17.3%)	n=8 (18.6%)	n=12 (21.8%)	
	1-2 times a week	n=16 (30.8%)	n=17 (39.5%)	n=10 (18.2%)	
	Once in 15 days	n=0 (0.0%)	n=1 (2.3%)	n=0 (0.0%)	
	Once a month	n=0 (0.0%)	n=0 (0.0%)	n=0 (0.0%)	
	I do not consume	n=0 (0.0%)	n=3 (7.0%)	n=1 (1.8%)	
Offal (heart, kidney, liver, tripe, etc.)	Everyday	n=1 (1.9%)	n=0 (0.0%)	n=1 (1.8%)	0.58
	Every other day	n=1 (1.9%)	n=0 (0.0%)	n=0 (0.0%)	
	1-2 times a week	n=13 (25.05)	n=15 (34.9%)	n=18 (32.7%)	
	Once in 15 days	n=5 (9.6%)	n=5 (11.6%)	n=4 (7.3%)	
	Once a month	n=13 (25.0%)	n=8 (18.6%)	n=6 (10.9%)	
	I do not consume	n=19 (36.55)	n=15 (34.9%)	n=26 (47.3%)	
Salami, soudjuk, sausage	Everyday	n=12 (23.1%)	n=6 (14.0%)	n=11 (20.0%)	0.82
	Every other day	n=6 (11.5%)	n=3 (7.0%)	n=5 (9.1%)	
	1-2 times a week	n=17 (32.7%)	n=15 (34.9%)	n=20 (36.4%)	
	Once in 15 days	n=3 (5.8%)	n=6 (14.0%)	n=2 (3.6%)	
	Once a month	n=3 (5.8%)	n=4 (9.3%)	n=3 (5.5%)	
	I do not consume	n=12 (21.2%)	n=9 (20.9%)	n=14 (25.5%)	
Legumes	Everyday	n=0 (0.0%)	n=1 (2.3%)	n=0 (0.0%)	0.91
	Every other day	n=4 (7.7%)	n=1 (2.3%)	n=2 (3.6%)	
	1-2 times a week	n=31 (59.6%)	n=29 (67.4%)	n=32 (58.2%)	
	Once in 15 days	n=7 (13.5%)	n=6 (14.0%)	n=9 (16.4%)	
	Once a month	n=7 (13.5%)	n=5 (11.6%)	n=8 (14.5%)	
	I do not consume	n=3 (5.8%)	n=1 (2.3%)	n=4 (7.3%)	

n = Number of samples.
The categorical variables in the table are indicated as number (n) and percentage (%). *The values shown in bold in the table are statistically significant ($p < 0.05$). The difference among the groups was analyzed by Fisher's Exact test for categorical variables.

The distribution of consumption frequency of vegetables and fruits of the groups is shown in Table 4.10. Although no statistically significant difference was found between the groups (p <0.82, x^2= 6.20), it was observed that 34.6% (n = 18) of diabetes group, 41.9% (n = 18) of hypertension group and 34.5% (n = 19) of hyperlipidemia group consumed green leafy vegetables every day. When the consumption of other vegetables was compared, although there was no significant difference between groups statistically (p <0.41, x^2 = 7.62), it was observed that 53.8% (n = 28) of the diabetes group, 51.2% of the hyperlipidemia group (n = 22) and 58.2% (n = 32) of hypertension group consumed other vegetables every day. Although there was no significant difference between groups statistically (p <0.25, x^2 = 11.91, p <0.55, x^2= 8.75, respectively), it was observed that in each of the diabetes, hypertension and hyperlipidemia groups (n = 17, 32.7%, n = 21, 48.8%, n = 17, 30.9% respectively) fresh fruits were consumed at most 1-2 times a week, while the dried fruits in the diabetes and hyperlipidemia groups (n = 18,% 34.6, n = 24, 43.6% respectively) were consumed daily, in hypertension group (n = 14, 32.6%) they were consumed 1-2 times a week.

Table 4.10. Distribution of Consumption Frequency of Vegetables and Fruit of Groups

Food	Frequency	Diabetes (n=52)	Hypertension (n=43)	Hyperlipidemia (n=55)	p-value
Green leafy vegetables (spinach, leek, green beans, broccoli, purslane etc.)	Everyday	n=18 (34.6%)	n=18 (41.9%)	n=19 (34.5%)	0.82
	Every other day	n=5 (9.6%)	n=8 (18.6%)	n=11 (20.0%)	
	1-2 times a week	n=14 (26.9%)	n=7 (16.3%)	n=12 (21.8%)	
	Once in 15 days	n=2 (3.8%)	n=1 (2.3%)	n=2 (3.6%)	
	Once a month	n=1 (1.9%)	n=0 (0.0%)	n=2 (3.6%)	
	I do not consume	n=12 (23.1%)	n=9 (20.9%)	n=9 (16.4%)	
Other vegetables	Everyday	n=28 (53.8%)	n=22 (51.2%)	n=32 (58.2%)	0.41
	Every other day	n=11 (21.2%)	n=12 (27.9%)	n=16 (29.1%)	
	1-2 times a week	n=12 (23.1%)	n=7 (16.3%)	n=7 (12.7%)	
	Once in 15 days	n=0 (0.0%)	n=2 (4.7%)	n=0 (0.0%)	
	Once a month	n=0 (0.0%)	n=0 (0.0%)	n=0 (0.0%)	
	I do not consume	n=1 (1.9%)	n=0 (0.0%)	n=0 (0.0%)	
Fresh fruits	Everyday	n=18 (34.6%)	n=12 (27.9%)	n=17 (30.9%)	0.25
	Every other day	n=3 (5.8%)	n=1 (2.3%)	n=7 (12.7%)	
	1-2 times a week	n=17 (32.7%)	n=21 (48.8%)	n=17 (30.9%)	
	Once in 15 days	n=4 (7.7%)	n=6 (14.0%)	n=7 (12.7%)	
	Once a month	n=7 (13.5%)	n=3 (7.0%)	n=7 (12.7%)	
	I do not consume	n=3 (5.8%)	n=0 (0.0%)	n=0 (0.0%)	
Dry fruits (apricot, grape, berry, plum)	Everyday	n=18 (34.6%)	n=13 (30.2%)	n=24 (43.6%)	0.55
	Every other day	n=1 (1.9%)	n=2 (4.7%)	n=2 (3.6%)	
	1-2 times a week	n=14 (26.9%)	n=14 (32.6%)	n=13 (23.6%)	
	Once in 15 days	n=5 (9.6%)	n=4 (9.3%)	n=2 (3.6%)	
	Once a month	n=4 (7.7%)	n=1 (2.3%)	n=7 (12.7%)	
	I do not consume	n=10 (19.2%)	n=9 (20.9%)	n=7 (12.7%)	

n = Number of samples.
The categorical variables in the table are indicated as number (n) and percentage (%). The difference among the groups was analyzed by Fisher's Exact test for categorical variables.

Distribution of bread and other cereals consumption frequency of the groups is shown in Table 4.11. When the consumption of white and brown bread were compared, although there was no significant difference between groups statistically (p <0.65, x^2= 4.34, p <0.35, x^2= 10.50, respectively), white bread was consumed at most in each of the diabetes, hypertension and hyperlipidemia groups everyday (n = 33, 63.5%, n = 32, 74.4%, n = 39, 70.9% respectively), while brown bread (n = 29, 55.8%, n = 23 53.5%, n = 31, 56.4% respectively) was not consumed. When rice consumption was compared, there was no significant difference between groups statistically (p <0.57, x^2= 8.46), it was observed that 36.5% (n = 19) of the diabetes group and 44.2% (n = 19) of the hypertension group consumed rice 1-2 times a week, and 38.2% (n = 21) of the hyperlipidemia group consumed rice daily. Although there was no significant difference between groups of diabetes, hypertension and hyperlipidemia statistically (p <0.27, x^2 = 11.83, p <0.35, x^2= 10.62, respectively), it was observed that both bulgur (n = 22, 42.3%, n = 20, 46.5%, n = 18, 32.7% respectively) and pasta (n = 25, 48. 1%, , n = 23, 53.5%, n = 27, 49.1% respectively) were consumed 1-2 times a week by each group.

Table 4.11. Distribution of Bread and Other Cereals Consumption Frequency of Groups

Food	Frequency	Diabetes (n=52)	Hypertension (n=43)	Hyperlipidemia (n=55)	p-value
White bread	Everyday	n=33 (63.5%)	n=32 (74.4%)	n=39 (70.9%)	0.65
	Every other day	n=3 (5.8%)	n=1 (2.3%)	n=0 (0.0%)	
	1-2 times a week	n=0 (0.0%)	n=2 (4.7%)	n=2 (3.6%)	
	Once in 15 days	n=0 (0.0%)	n=0 (0.0%)	n=0 (0.0%)	
	Once a month	n=0 (0.0%)	n=0 (0.0%)	n=0 (0.0%)	
	I do not consume	n=16 (30.8%)	n=8 (18.6%)	n=14 (25.5%)	
Brown bread	Everyday	n=18 (34.6%)	n=8 (18.6%)	n=13 (23.6%)	0.35
	Every other day	n=1 (1.9%)	n=0 (0.0%)	n=0 (0.0%)	
	1-2 times a week	n=0 (0.0%)	n=6 (14.0%)	n=4 (7.3%)	
	Once in 15 days	n=1 (1.9%)	n=2 (4.7%)	n=3 (5.5%)	
	Once a month	n=1 (1.9%)	n=4 (9.3%)	n=4 (7.3%)	
	I do not consume	n=29 (55.8%)	n=23 (53.5%)	n=31 (56.4%)	
Rice	Everyday	n=14 (26.9%)	n=15 (34.9%)	n=21 (38.2%)	0.57
	Every other day	n=11 (21.2%)	n=6 (14.0%)	n=10 (18.2%)	
	1-2 times a week	n=19 (36.5%)	n=19 (44.2%)	n=20 (36.4%)	
	Once in 15 days	n=3 (5.8%)	n=1 (2.3%)	n=2 (3.6%)	
	Once a month	n=1 (1.9%)	n=2 (4.7%)	n=0 (0.0%)	
	I do not consume	n=4 (7.7%)	n=0 (0.0%)	n=2 (3.6%)	
Bulgur	Everyday	n=7 (13.5%)	n=7 (16.3%)	n=12 (21.8%)	0.27
	Every other day	n=12 (23.1%)	n=9 (20.9%)	n=18 (32.7%)	
	1-2 times a week	n=22 (42.3%)	n=20 (46.5%)	n=18 (32.7%)	
	1 in 15 days	n=6 (11.5%)	n=1 (2.3%)	n=3 (5.5%)	
	Once in 15 days	n=2 (3.8%)	n=4 (9.3%)	n=0 (0.0%)	
	I do not consume	n=3 (5.8%)	n=2 (4.7%)	n=4 (7.3%)	
Pasta	Everyday	n=7 (13.5%)	n=4 (9.3%)	n=12 (21.8%)	0.35
	Every other day	n=6 (11.5%)	n=7 (16.3%)	n=11 (20.0%)	
	1-2 times a week	n=25 (48.1%)	n=23 (53.5%)	n=27 (49.1%)	
	Once in 15 days	n=7 (13.5%)	n=6 (14.0%)	n=2 (3.6%)	
	Once a month	n=5 (9.6%)	n=3 (7.0%)	n=2 (3.6%)	
	I do not consume	n=2 (3.8%)	n=0 (0.0%)	n=1 (1.8%)	

n = Number of samples.
The categorical variables in the table are indicated as number (n) and percentage (%). The difference among the groups was analyzed by Fisher's Exact test for categorical variables.

Distribution of sugar and sweet consumption frequency of the groups is shown in Table 4.12. When sugar consumption was compared, although there was no significant difference between groups statistically (p <0.24, x^2 = 4.64), while 55.8% (n = 29) of the diabetes group did not consume sugar, 51.2% (n = 22) of the hypertension group and 54.5% (n = 30) of the hyperlipidemia group did not consume sugar. When honey, jam and molasses consumption were compared, although there was no significant difference between groups statistically (p <0.54, x^2 = 8.69), it was observed that in the diabetes group, honey, jam and molasses were consumed daily at most (n = 21, 40.4%), whereas in the hypertension and hyperlipidemia groups (n = 22, 51.2%, n = 22, 40% respectively) honey, jam and molasses were consumed 1-2 times a week. Although there was no significant difference between groups statistically (p <0.85, x^2= 4.18), it was observed that milky desserts in each of the diabetes, hypertension and hyperlipidemia groups (n = 25, 48.1%, n = 19, 44.2%, n = 19, 34.5% respectively).were consumed 1-2 times a week at most. When fruit dessert consumption was compared, although there was no significant difference between groups statistically (p <0.78, x^2 = 6.72), 38.5% (n = 20) of the diabetes group consumed fruit dessert once a month, 34.9% (n = 15) of the hypertension group consumed once in 15 days and 29.1% (n = 16) of the hyperlipidemia group consumed 1-2 times a week. When the consumption of dough desserts was compared, although there was no significant difference between groups statistically (p <0.6, x^2 = 8.29), it was observed that in each of the diabetic, hypertension and hyperlipidemia groups, the dough desserts (n = 25, 48.1%, n = 15, 34.9%, n = 26, 47.3%) were consumed 1-2 times a week at most.

Table 4.12. Distribution of Sugar and Sweet Consumption Frequencies of Groups

Food	Frequency	Diabetes (n=52)	Hypertension (n=43)	Hyperlipidemia (n=55)	p-value
Sugar	Everyday	n=23 (44.2%)	n=22 (51.2%)	n=30 (54.5%)	0.24
	Every other day	n=0 (0.0%)	n=0 (0.0%)	n=0 (0.0%)	
	1-2 times a week	n=0 (0.0%)	n=2 (4.7%)	n=0 (0.0%)	
	Once in 15 days	n=0 (0.0%)	n=0 (0.0%)	n=0 (0.0%)	
	Once a month	n=0 (0.0%)	n=0 (0.0%)	n=0 (0.0%)	
	I do not consume	n=29 (55.8%)	n=19 (44.2%)	n=25 (45.5%)	
Honey, jam, molasses	Everyday	n=21 (40.4%)	n=11 (25.6%)	n=15 (27.3%)	0.54
	Every other day	n=8 (15.4%)	n=8 (18.6%)	n=8 (14.5%)	
	1-2 times a week	n=20 (38.5%)	n=22 (51.2%)	n=22 (40.0%)	
	Once in 15 days	n=0 (0.0%)	n=0 (0.0%)	n=2 (3.6%)	
	Once a month	n=1 (1.9%)	n=1 (2.3%)	n=4 (7.3%)	
	I do not consume	n=2 (3.8%)	n=1 (2.3%)	n=4 (7.3%)	
Milky desserts	Everyday	n=5 (9.6%)	n=4 (9.3%)	n=8 (14.5%)	0.85
	Every other day	n=9 (17.3%)	n=9 (20.9%)	n=15 (27.3%)	
	1-2 times a week	n=25 (48.1%)	n=19 (44.2%)	n=19 (34.5%)	
	Once in 15 days	n=3 (5.8%)	n=4 (9.3%)	n=5 (9.1%)	
	Once a month	n=10 (19.2%)	n=7 (16.3%)	n=8 (14.5%)	
	I do not consume	n=0 (0.0%)	n=0 (0.0%)	n=0 (0.0%)	
Fruit desserts	Everyday	n=0 (0.0%)	n=0 (0.0%)	n=1 (1.8%)	0.78
	Every other day	n=2 (3.8%)	n=2 (4.7%)	n=2 (3.6%)	
	1-2 times a week	n=8 (15.4%)	n=7 (16.3%)	n=16 (29.1%)	
	Once in 15 days	n=15 (28.8%)	n=15 (34.9%)	n=16 (29.1%)	
	Once a month	n=20 (38.5%)	n=15 (34.9%)	n=15 (27.3%)	
	I do not consume	n=7 (13.5%)	n=4 (9.3%)	n=5 (9.1%)	
Dough desserts	Everyday	n=5 (9.6%)	n=2 (4.7%)	n=3 (5.5%)	0.60
	Every other day	n=12 (23.1%)	n=10 (23.3%)	n=17 (30.9%)	
	1-2 times a week	n=25 (48.1%)	n=15 (34.9%)	n=26 (47.3%)	
	Once in 15 days	n=4 (7.7%)	n=5 (11.6%)	n=4 (7.3%)	
	Once a month	n=5 (9.6%)	n=9 (20.9%)	n=4 (7.3%)	
	I do not consume	n=1 (1.9%)	n=2 (4.7%)	n=1 (1.8%)	

n = Number of samples.
The categorical variables in the table are indicated as number (n) and percentage (%). The difference among the groups was analyzed by Fisher's Exact test for categorical variables.

5. DISCUSSION and CONCLUSION

The basis of healthy life is adequate and balanced nutrition. It is important to pay attention to the principles of healthy nutrition in order to prevent chronic diseases associated with nutrition and to increase the treatment effectiveness of the existing disease.

According to data by WHO, 1.6 million people lost their lives due to diabetes in 2016 and this figure was identified as 4% of global deaths (14). According to data by 2017 TurkStat data, the most common type 2 diabetes melltus is the fourth leading cause of death in our country with a rate of 4.8% (15). Based on Turkey Diabetes, Hypertension, Obesity and Endocrinology Diseases Prevalence Study-II, it was emphasized that the prevalence of diabetes in adults in 2010 rised up to 13.7% in our country due to inadequate, unhealthy and unbalanced nutrition and inactive lifestyle (10).

According to data by WHO, cardiovascular diseases are the leading cause of death with 17.9 million deaths in 2016 (14). According to data by TurkStat data, 8.9% of deaths due to cardiovascular diseases in 2017 were caused by hypertension in our country (15). In many European countries and the United States, approximately 25-30% of adults have hypertension (63). In Turkey, the prevalence of hypertension in adult individuals in 2012 was found to be 30.3% according to Turkish Hypertension Prevalence Study (63). Hyperlipidemia as well as hypertension, is one of the most important risk factors for the incidence of cardiovascular disease due to its effect on atherosclerosis due to abnormalities in lipid metabolism. According to the data of 2008 by WHO, the prevalence of hyperlipidemia in adults is 39% (17). According to the data of 2011-2014 by NHANES, it is indicated that approximately 28.5 million adults have high cholesterol and hyperlipidemia, the prevalence of high cholesterol and hyperlipidemia is 11.9% (68). In meta-analysis of studies in Turkey the prevalence of hyperlipidemia is 29.1% (69).

Studies showed that nutritional treatment reduces high cholesterol by 10-15% and blood pressure by 5-20 mmHg, regulates blood sugar, and reduces the incidence of cardiovascular disease by 25-30% (61,66,70).

In the light of these information in the literature, the study was started with the following questions:

1. What are the meal patterns and dietary habits of individuals who were diagnosed with diabetes, hypertension and hyperlipidemia?

2. Are the dietary habits of individuals who were diagnosed with diabetes, hypertension and hyperlipidemia different from each other?

Based on these question, it was aimed to compare nutritional habits of individuals diagnosed with diabetes, hypertension and hyperlipidemia. For this purpose, firstly the demographic and nutritional habits of the groups were determined, the characteristics of the groups were defined and the possible differences between the groups were compared.

Taking into consideration the marital status, 67.3% (n = 35) of diabetic patients, 90.7% (n = 39) of hypertension patients and 78.2% (n = 43) of hyperlipidemia patients were married and there was a significant difference between the groups statistically ($p < 0.00$, $x^2 = 13.33$). In a study conducted by Erdem et al. with 160 patients who were diagnosed with a type2 DM, similar to our study, it was observed that 76.2% (n = 122) of the patients were married (10). In a study conducted by Yardımcı et al. with 110 patients it was observed that 65% of individuals with hypertension were married (16).

The educational status of individuals plays an important role in terms of chronic diseases and eating habits. Examining the educational status of the groups in our study, it was observed that high school graduates were higher in each group (n = 30, 57.7%, n = 18, 41.9%, n = 37, 67.3%, respectively) and there was a significant difference between the groups statistically. ($p<0.00$). In a study conducted by Erdem et al. with 160 patients who were diagnosed with a type2 DM with an average age of 52.6 ± 9.4, it was found that 61.9% of the patients were primary school graduates (10). In our study, while high school graduates were higher in each group, in a study conducted by Haklı et al. with 150 elderly people with heart disease aged 65 and over, it was observed that 65.3% of them were primary school graduates (13). This situation is thought to be due to the fact that our participants who attending diet polyclinic at a private hospital have high socioeconomic level.

The Body Mass Index (BMI), which is an indicator of obesity and is seen as an important risk factor for diabetes and cardiovascular disease, is used to classify obesity. According to this classification, individuals with a value of 30 kg / m2 and above are included in the obese class (3). Considering the demographic characteristics of the groups in our study, BMI was observed as higher in the diabetes group (34.03 ± 7.73, n = 52) than in the hypertension (33.04 ± 6.09, n = 43) and hyperlipidemia group (30.78 ± 4.61, n = 55) and there was a significant difference between groups statistically ($p <0,03$). In 2015 in a thesis study which was belong to Börekçi BMI values of individuals with type 2 DM were examined. According to this study in which 103 individuals were included,

similar to our study, the average BMI was observed as 33.57 ± 5.9 (61). In a study conducted by Sidhu et.al., it was noted that BMI values of individuals with chronic diseases such as diabetes, hypertension and dyslipidemia were higher than 27 kg/m2 (71). In the epidemiological study which was conducted by Wang et al. with 78,704 participants for a decade, it was observed that the prevalence of obesity increased from 14.6% to 21.8% and therefore the prevalence of diabetes, hypertension and dyslipidemia that are known to be associated with BMI increased as well (72). In a 5-year cohort study with 15.464 participants by Okamura et al., a significant relationship was found among the risk of developing diabetes in individuals with a BMI of 25 kg / m² (73).

Considering the medication, it was observed that diabetes (n = 46, 88.5%) and hypertension patients (n = 38, 88.4%) were taking more medication than hyperlipidemia patients (n = 3, 5.5%) and there was a significant difference between groups statistically (p <0.00, x^2 = 98.43). In a study that was conducted by Erdem et al., each individual with diabetes and also in a study conducted by Padme with hypertension patients, it was observed that all individuals used medication (10,74). In a study conducted by Sarıkaya with 40 patients diagnosed with hyperlipidemia, it was observed that 45% of the participants used medication (75). In these studies, the duration of diagnosis and treatment of the patients were questioned but they were not questioned in our study.

The frequency of meals plays an important role in meeting the physiological needs of the body, maintaining health, improving and enhancing the quality of life. When the distribution of the number of meals was examined in all three groups, although there was no significant difference between the groups statistically (p <0.28, x^2 = 2.52), it was observed that 44.2% (n = 23) of diabetes group, 34.9% of hypertension group (n = 15) and 50.9% (n = 28) of the hyperlipidemia group consumed three main meals a day. In a study conducted by Börekçi with 103 individuals with type 2 DM, unlike our study, it was found that 78.6% of the participants consumed three main meals a day (61). Yardımcı et.al., observed in a study with 110 participants that 56.4% of individuals with hypertension consumed 3 main meals a day (16). In a study examining the effect of nutrition education on main meals, 82 people diagnosed with hyperlipidemia were examined before and after nutrition education. 68.8% of the participants consumed three main meals before the training, whereas 58.5% of them consumed three main meals after the training (76). In our study, it was not questioned whether any previous nutritional education was received and the difference was thought to be due to this situation.

Considering the main meal skipping status, although there was no significant difference between the groups statistically (p <0.24, x^2 = 2.89), it was observed that hypertension group (58.1%, n = 25) skipped more meals than diabetes group (44.2%, n = 23) and hyperlipidemia group (41.8%, n = 23). This result was thought to be due to the fact that the average age of individuals with hypertension was higher, and that individuals were housewives and retired. In a study conducted by Tülek with 80 type 2 DM patients, unlike our study, it was observed that 21.3% of patients skipped main meals (77). Karamustafa found in his thesis study that 19% of 122 women with hyperlipidemia skipped meals (78). Önen, in his study with 741 people over 30 years of age similiar to our study, found that 46.6% of the participants with hypertension skipped meals (79).

Considering the frequently skipped meals in our study, it was found that the diabetic group skipped the breakfast (n = 31, 59.6%) and the hypertension and hyperlipidemia group skipped the lunch, and there was a significant difference between the groups statistically (p <0.02, x^2 = 11.3). In our study, time of the meals were not questioned. In the studies conducted by Börekçi and Tülek with type DM patients, unlike our study, they questioned the time of the meals, it was found that lunch was the most skipped main meal (61,77).

When the main reasons for skipping meals were examined, although there was no significant difference between the groups statistically (p <0.35, x^2 = 6.73), diabetes (n = 18, 34.6%) and hypertension group (n = 15,%) 34.9) skipped the main meal because they did not have a desire for it, whereas hyperlipidemia group (n = 26, 47.3%) skipped the main meal to lose weight / to maintain their weight. This result was considered to be due to the small average age of individuals with hyperlipidemia. In his study, Karamustafa found that in 58 hyperlipidemic individuals with an average age of 37.9 ± 6.62, 25.9% of them skipped meal because they had breakfast, 19% of them skipped because they did not have a desire and 19% of them skipped due to the lack of time (78).

Looking at the snacking habits of the groups in our study, although there was no significant difference between the groups statistically (p <0.52, x^2 =1.30), in the diabetes, hypertension and hyperlipidemia groups, cake/biscuit/chips (n = 36, 69.2%, n = 25, 58.1%, n = 36, 55.5%, respectively) were the most preferred snacks. Unlike our study, Kaya, in his study with 40 newly diagnosed hypertensive patients aged 26-75, observed that 52.5% of the participants consumed fruit, 20% consumed yoghurt and 15% consumed foods such as biscuits / cookies (80). This difference is thought to be due to the fact that the duration of disease diagnosis was not investigated in our study.

Considering the habits of eating out, each of diabetes, hypertension and hyperlipidemia group (n = 19, 36.5%, n = 16, 37.5%, n = 25, 45.5%, respectively) was found to eat out 1-2 times a week at most. In terms of food selection, although there was no significant difference between the groups statistically, it was observed that the diabetes group (n=22, %42,3) preferred the kebab/doner/wrap most, whereas hypertension (n=17, %39,5) and hyperlipidemia group (n = 23, 41.8%) preferred grill dishes (p <0.75, x^2 = 0.55, p <0.97, x^2 = 0.05, respectively). Similiar to our study, Karamustafa in his study found that individuals with hyperlipidemia (n = 58) ate out at most 1-3 times a week and 50% of them preferred to eat kebab/grill dishes (78).

Examining the consumption frequency of milk and milk derivatives of the groups in our study, it was observed that 28.8% of the diabetes group (n = 15) and 30.9% of the hyperlipidemia group (n = 17) consumed whole milk daily, whereas 34.9% of the hypertension group (n = 15) consumed whole milk 1-2 times a week. In each of the diabetes, hypertension and hyperlipidemia groups, it was observed that semi-skimmed (n = 33, 63.5%, n = 28, 65.1%, n = 34, 61.8%) and skimmed milk (n = 34, respectively) 65.4, n = 29, 67.4%, n = 37, 67.3%) were not consumed at most. In each of the diabetes, hypertension and hyperlipidemia groups, it was observed that whole fat yoghurt was consumed at most daily (n = 28, 53.8%, n = 20, 46.5%, n = 35, 63.6% respectively), whereas non- fat yogurt was not consumed at most (n = 34, 65.4%, n = 28, 65.1%, n = 35, 63.6% respectively). It was observed that 44.2% of the diabetes group (n = 23), 41.9% of the hypertension group (n = 18) and 52.7% of the hyperlipidemia group (n = 29) consumed cheese daily. Similiar to our study, Tülek observed in his study with individuals with type 2 DM that 22.5% of the participants consumed whole milk, 45% consumed whole-fat yogurt and 76.3% of cheese daily (77). In a study conducted by Padem with individuals who have hypertension, it was found that 21.7% of the participants consumed whole milk, 40% whole fat yoghurt and 41.7% cheese daily (74). In both studies, similar to our study, it was determined that the participants did not prefer skimmed milk and non-fat yoghurt.

Considering the consumption frequency of meat and meat derivatives of the groups in our study, 48.4% (n = 25) of the diabetes group consumed red meat daily, while 34.9% (n = 20) of the hypertension group consumed 1-2 times a week and 34.5% (n = 19) of hyperlipidemia group consumed red meat every other day. Unlike our study, Senadheera et al. observed in their study with 100 patients with type 2 DM that 92% of the participants did not consume red meat and 2% consumed once a week (81). This

situation is thought to be due to the cultural differences of the individuals participating in the study. Unlike our study, Yardımcı et.al., observed in a study with 110 participants that 50% of he participants consumed red meat less than once in 15 days (16). In the study that Padem conducted with hypertensive individuals, it was found that 23.3% of the participants consumed red meat daily (74). In these studies, it is thought that this situation caused by the different socioeconomic levels of the individuals participating in the study. In a study conducted by Milias et al. with 5003 adults with ages between 18 and 74 it was found that the group with hyperlipidemia (n = 960) consumed less red meat than the the group without hyperlipidemia (82).

In each diabetes, hypertension and hyperlipidemia group, chicken (n = 26, 50%, n = 24, 55.8%, n = 20, 36.4%, respectively) was consumed at most 1-2 times a week, while fish (n = 20, 38.5%, n = 20, 46.5%, n = 20, 36.4%, respectively) was consumed once a month. Similar to our study, in his study with 103 individuals with type 2 DM, Börekçi observed that 62.1% of the participants consumed chicken 1-2 times a week and 37.8% consumed fish once a month (61). In a study conducted by Padem with 60 hypertensive individuals, it was observed that 36.7% of the participants consumed chicken once a week, 13.3% consumed chicken twice a week, 35% consumed fish once in 15 days and 33.3% consumed fish once a week (74). In a study conducted by Nakamura et al. with 250 males with a range of 40-49 years, it was observed that 58.8% (n = 147) of the participants consumed fish less than 4 times a week and 41.2% (n = 103) consumed fish more than 4 times a week (83). This situation is thought to be due to the cultural differences of the individuals participating in the study.

Looking at egg consumption, it was observed that 51.9% (n = 27) of the diabetes group and 58.2% (n = 32) of the hyperlipidemia group consumed eggs daily, and 39.5% (n = 17) of the hypertension group consumed 1-2 times a week. Senadheera et al. found in their study with 100 type 2 diabetic patients that 70% of the participants consumed less than 2 eggs per week (81). In a study conducted with 60 hypertensive individuals, similar to our study, Padem observed that 30% of the participants ate eggs twice a week (74).

Looking at the consumption of offal, salami, soujouk and sausage, in each of the diabetes, hypertension and hyperlipidemia groups offal was not consumed (n = 19, 36.5%, n = 15, 34.9%, n = 26, 47.3% respectively) whereas salami, soujouk and sausage (n = 17, 32.7%, n = 15, 34.9%, n = 20, 36.4% respectively) were consumed 1-2 times a week. Unlike our study, in a study conducted by Börekçi with 103 type 2 diabetes patients, it was observed that 93.2% of the participants did not consume offal (61). Yardımcı et.al.

observed in a study with 110 participants that 61.8% of the participants consumed offal and 10% consumed salami, soujouk and sausage 1-2 times a week (16). In his study with a total of 150 individuals including patients newly diagnosed hyperlipidemia (n = 50), hypertension (n = 50) and hypertension and hyperlipidemia together (n = 50), unlike our study, Bayram found that in each group (70%, 76%, 60% respectively) generally offal was consumed (84). This difference is thought to be due to the fact that the duration of disease diagnosis was not investigated in our study.

Considering the consumption of legumes, 59.6% (n = 31) of the diabetes group, 67.4% (n = 29) of the hypertension group and 58.2% (n = 32) of the hyperlipidemia group consumed legumes 1-2 times a week. In a study conducted by Tülek with 80 type 2 DM patients, similiar to our study, it was found that 43.8% of the participants consumed legumes 1-2 times a week (77). In a study conducted by Padem with 60 hypertensive individuals, it was observed that 51.7% of the participants consumed legumes once a week and 31.7% consumed twice a week (74). Similar to our study, in his study with a total of 150 individuals including patients newly diagnosed hyperlipidemia (n = 50), hypertension (n = 50) and hypertension and hyperlipidemia together (n = 50), Bayram observed that 57.3% of the participants consumed legumes once a week (84).

Examining the consumption frequency of vegetables and fruits of the groups in our study, 34.6% (n = 18) of the diabetes group, 41.9% (n = 18) of the hypertension group and 34.5% (n =) of the hyperlipidemia group 19) consumed with green leafy vegetables daily. It was found that fresh fruits were consumed 1-2 times a week (n = 17, 32.7%, n = 21, 48.8%, n = 17, 30.9%, respectively) in each of the diabetes, hypertension and hyperlipidemia groups. Unlike our study, Senadheera et al. observed in their study with 100 patients with type 2 DM that 64% of the participants consumed green leafy vegetables daily (81). This situation is thought to be due to the cultural differences of the individuals participating in the study. Bayram, in his study with a total of 150 individuals including patients newly diagnosed hyperlipidemia (n = 50), hypertension (n = 50) and hypertension and hyperlipidemia together (n = 50), observed that the participants did not consume vegetables (86%, 80%, 76%) and fruit (74%, 66%, 84% respectively) at most daily (84). Borgi et al., in their study found that the risk of hypertension reduced with increasing consumption of fruits and vegetables (85).

Considering the consumption frequency of bread and other cereals of the groups included in our study, although there was no significant difference between groups statistically (p <0.65, x^2 = 4.34, p <0.35, x^2 = 10.50, respectively), it was observed that

white bread (n = 33, 63.5%, n = 32, 74.4%, n = 39, 70.9% consuming daily respectively) was preferred more than brown bread (n = 18, 34.6%, n = 8, 18.6%, n = 13, 23.6% consuming daily respectively). Similarly, although there was no significant difference between diabetes, hypertension and hyperlipidemia groups statistically (p <0.57, x^2 = 8.46, p <0.27, x^2 = 11.83, respectively), rice consumption was found to be more than (n = 14, 26.9%, n = 15, 34.9%, n = 21, 38.2%, respectively) bulgur consumption (n = 7, 13.5%, n = 7, 16.3%, n = 12, 21.8%, respectively). Similar to our study, in a study conducted by Börekçi with 103 individuals with type 2 DM, it was found that 88.3% of the participants consumed white bread, 33% of whole wheat bread and 16.5% of other bread types daily. Furthermore, rice (60.2%) and bulgur consumption (63.1%) was observed as 1-2 times a week (61). Similar to our study, in a study conducted by Padem with 60 hypertensive individuals, it was found that 63.3% of the participants consumed white bread daily, 55% did not consume brown bread, 31.7% of the participants consumed rice twice a week and 43.3% consumed bulgur once a week (74). Bayram, in his study with a total of 150 individuals including patients newly diagnosed hyperlipidemia (n = 50), hypertension (n = 50) and hypertension and hyperlipidemia together (n = 50), observed that each group consumed rice (54%, 52%, 58%) at most once a week, whereas it did not consume bulgur (70%, 74%, 70% respectively) (84). Between 1966 and 2012, Ye et al. studied 45 prospective cohort studies and 21 randomized controlled trials in terms of the relationship between whole grain consumption and type 2 diabetes, cardiovascular disease, and weight gain. Findings from this meta-analysis showed that whole grain consumption has beneficial effects on the prevention of type 2 diabetes and cardiovascular diseases (86).

Examining the sugar and sweet consumption frequency of the groups in our study, it was found that 55.8% (n = 29) of the diabetes group used sugar, 51.2% (n = 22) of the hypertension group and 54.5% (n = 22) of the hyperlipidemia group.(n = 30) did not use sugar. In the diabetic group, honey, jam and molasses were consumed at most (n = 21, 40.4%) daily, whereas in hypertension and hyperlipidemia groups (n = 22, 51.2%, n = 22, 40% respectively) they were consumed 1-2 times a week. In each of the diabetes, hypertension and hyperlipidemia groups, milk desserts (n = 25, 48.1%, n = 19, 44.2%, n = 19, 34.5%) were consumed at most 1-2 times a week. Dough desserts were consumed at most 1-2 times a week (n = 25, 48.1%, n = 15, 34.9%, n= 26, 47.3%, respectively) in the diabetes, hypertension and hyperlipidemia groups. Unlike our study, in his study with individuals with type 2 DM, Tülek observed that 72.5% of the participants did not

consume sugar, 48.8% did not consume honey / molasses and 25% did not consume milk dessert (77). Unlike our study, Senadheera et al. observed in their study with 100 patients with type 2 DM that 66% of the participants did not consume sugar (81). In a study conducted by Padem with 60 hypertensive individuals, similar to our study it was found that 53.3% of the participants consumed sugar every day, 40% consumed excessive honey/jam every day, 23.3% consumed molasses twice a week, 46.7% consumed milk dessert once in 15 days and 48.3% consumed dough desserts once in 15 days (74). Bayram, in his study with a total of 150 individuals including patients newly diagnosed hyperlipidemia (n = 50), hypertension (n = 50) and hypertension and hyperlipidemia together (n = 50), observed that 94.6% of the participants consumed sugar every day, 37.3% consumed jam every day, 36.7% consumed milk dessert once in 15 days and 37.3% consumed dough once in 15 days. In the same study, it was found that 41.3% of the participants did not consume honey and 42% did not consume molasses (84).

As can be seen from all the findings, articles in the literature and the results obtained from the Turkish thesis studies, different results regarding the relationship between eating habits and chronic diseases draw attention. This situation reveals the need for further studies. Obtaining nutritional data of diabetes, hypertension and hyperlipidemia, which the cause of each is not yet fully elucidated, may be useful in guiding the selection of the appropriate nutritional plan for the proper patient for treatment. In addition, we believe that these studies will be necessary and guiding in terms of contributing to the success of the treatment rather than high cost medication.

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7. APPENDICES

APPENDIX 1. Information Form

Comparison of Dietary Habits of Individuals Are Diagnosed as Diabetes, Hypertension and Hyperlipidemia Who Attending to a Diet Polyclinic at a Private Hospital

Survey No : Date :

I. GENERAL INFORMATION

1. Gender:

a) Male b) Female

2. Age: ……

3. Marital Status:

a) Married b) Single c) Widow/Widower d) Partner

4. Your Occupation: .....

5. What is your educational status?

a) Primary School b) High School c) Associate Degree (Open Education Faculty) d) University e) Master / Doctor

6. Do you smoke?

a)Yes b) No c) Quit

7. Do you consume alcohol?

a)Yes b) No c) Quit

8. Do you have a disease that has been diagnosed by the physician and still continues? (If your answer is NO, move on to the 12nd question)

a) Yes b) No

9. If yes;

a) Diabetes b) Hypertension c) Hyperlipidemia d) Hypothyroidism

e) Heart disease f) Chronic liver disease g) Cancer h) Other

10. Are you taking any medication (s)? (If your answer is NO, move on to the 12nd question)

a) Yes b) No

11. If YES, for which disease do you use the medicine? If you TAKE any medication,

Disease name: …….

12. Do you exercise regularly?

(At least 3 days a week, at least 30 min a day brisk walking, jogging, soccer and so on.)

a) Yes b) No c) Sometimes (1-2 times a week)

II.DIETARY HABITS

1. How many meals do you eat?

….main meal (breakfast- lunch -dinner), ….snack (mid-morning, afternoon, night)

2. Do you skip main meal? (If your answer is NO, move on to the 4th question)

a) Yes b) Sometimes c) No

3. Which main meal do you skip in general?

a) Breakfast b) Lunch c) Dinner

4. Do you skip snacks? (If your answer is NO, move on to the 6th question)

a) Yes b) Sometimes c) No

5. Which snack do you usually skip?

a) Mid-morning(10: 00-11: 00)

b) Afternoon(15: 00-16: 00)

c) Night (20: 00-21: 00)

6. Why do you skip the main meal?

a) Workload c) Do not eat to lose weight / maintain weight

b) I do not desire d) Other (Please specify)

7. What is your reason for skipping meals?

a) Workload c) Do not eat to lose weight / maintain weight

b) I do not desire d) Other (Please specify)

8. How do you define your eating speed?

a) Fast b) Moderate c) Slow

9. Do you change the way you eat depending on your psychological state (sadness / joy)?

a) No c) I eat less

b) I eat more d) Other (Please specify)

10. Do you have snacking habit? (If your answer is NO, move on to the 12th question)

a) Yes b) Sometimes c) No

11. What do you usually prefer for a snack? Please specify. (You can select more than one.)

a) Tea / coffee d) Milk / yoghurt / ayran g) Nuts

b) Fruits / Fresh vegetables e) Cakes / biscuits / chips etc. h) Other

c) Carbonated beverages (Cola / soda etc.) f) Soft drinks / juice

12. How often do you eat out?

a) Never b) Everyday c) Every other day

d) 1-2 times a week e) Once in 15 days f) Once a month

13. What types of food do you prefer when eating out?

a) Fast food (hamburger, pizza, etc.)

b) Kebab / doner / wrap

c) Pita bread / lahmacun / pancake (gozleme)

d) Grill dishes

e) Juicy home cooking

f) Salad types

g) Other

14. Do you have a habit of eating before going to bed at night?

a) Yes b) No c) Sometimes

15. How many glasses of water do you consume in a day? (1 cup 200 ml)

a) 1-2 b) 3-5 c) 6-8 d) 8-10 e) 10 cups and more

III. ANTHROPOMETRIC MEASUREMENTS

This section will be completed by the researcher.

a) Height: _____cm.

b) Body weight: _____ kg.

c) BMI: _____ kg / m²

d) Body fat ratio: _____%

e) Waist-hip ratio: _____

APPENDIX 2. Food Frequency Questionnaire Form

FOODS	CONSUMPTION FREQUENCY					
	Everyday	Every other day	1-2 times in a week	Once in 15 days	Once a month	I do not consume
Milk and Derivatives						
Milk (whole fat)						
Milk (semi-skimmed)						
Milk (skimmed)						
Yoghurt (whole fat)						
Yoghurt (not-fat)						
Cheese						
Ayran						
Meat and Derivatives						
Red meat						
Chicken						
Fish						
Eggs						
Offal (heart, kidney, liver, tripe, etc.)						
Salami, soudjuk, sausage						
Legumes						
Vegetable and fruit						
Green leafy vegetables (spinach, leek, green beans, broccoli, purslane etc.)						
Other vegetables						
Fresh fruits						
Dry fruits (apricot, grape, berry, plum)						
Bread and Other Cereals						
White bread						
Brown bread						
Rice						
Bulgur						
Pasta						
Sugar and Sweets						
Sugar						
Honey, jam, molasses						
Milky desserts						
Fruit desserts						
Dough desserts						

Thank you for your contribution our scientific research

APPEND 3. Ethics Committee Approval

T.C. YEDİTEPE ÜNİVERSİTESİ

Sayı : 37068608-6100-15-1451
Konu: Klinik Araştırmalar Etik kurul Başvurusu hk.

15/02/2018

İlgili Makama (Fatma Tandoğan)

Yeditepe Üniversitesi, Sağlık Bilimleri Fakültesi öğretim üyesi Yrd. Doç. Dr. Güliz Dirimen Arıkan'ın sorumlu olduğu **"Özel Bir Hastanedeki Diyet Polikliniğine Başvuran Diyabet, Hipertansiyon ve Hiperlipidemi Tanısı Almış Bireylerin Beslenme Alışkanlıklarının Karşılaştırılması"** isimli araştırma projesine ait Klinik Araştırmalar Etik Kurulu (KAEK) Başvuru Dosyası (**1424** kayıt Numaralı KAEK Başvuru Dosyası), Yeditepe Üniversitesi Klinik Araştırmalar Etik Kurulu tarafından **14.02.2018** tarihli toplantıda incelenmiştir.

Kurul tarafından yapılan inceleme sonucu, yukarıdaki isimi belirtilen çalışmanın yapılmasının etik ve bilimsel açıdan uygun olduğuna karar verilmiştir (**KAEK Karar No: 812**).

Prof. Dr. Turgay ÇELİK
Yeditepe Üniversitesi
Klinik Araştırmalar Etik Kurulu Başkanı

Yeditepe Üniversitesi 26 Ağustos Yerleşimi, İnönü Mahallesi Kayışdağı Caddesi 34755 Ataşehir / İstanbul
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APPENDIX 4. Research Permit

ÖZEL ADATIP HASTANESİ

10/02 /2018

Sayı : ADA-K-MM-2018/ 90
Konu : Araştırma İzni

YEDİTEPE ÜNİVERSİTESİ

Klinik Araştırmalar Etik Kurulu Başkanlığına

Fatma TANDOĞAN adlı kişinin Özel Bir Hastanedeki Diyet Polikliniğine Başvuran Diyabet, Hipertansiyon ve Hiperlipidemi Tanısı Almış Bireylerin Beslenme Alışkanlıklarının Karşılaştırılması isimli araştırmayı yapmasında herhangi bir sakınca bulunmamakta bilgimiz dahilinde çalışmasını yürütmektedir.

Bilgilerinize arz/rica ederim.

Saygılarımla,

Dr. İlke ER
Mesul Müdür – Genel Direktör
Özel Adatıp Kurtköy Hastanesi

Yenişehir Mahallesi
Kardelen Sokak No:2
Pendik - İSTANBUL
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APPENDIX 5. Informed Consent Form

Dear Participant,

We invite you to a survey based on the **"Comparison of Nutritional Habits of Individuals Diagnosed with Diabetes, Hypertension and Hyperlipidemia Applying to a Diet Clinic in a Private Hospital"** conducted in our Department.

The decision whether or not to participate is entirely up to you. Before deciding whether you want to participate, it is important that you understand why, where, by whom the research was conducted, how your information was used, and what the study involved.

Please take the time to read the following information carefully. If you decide to participate in the study, you will be given this Informed Consent Form to sign. You are free to leave the study at any time. Your identity and answers will be kept confidential by researchers and will only be used for scientific purposes. Your information will not be shared with anyone or for any commercial purpose.

SUBJECT AND PURPOSE OF THE STUDY:

The study will be conducted with individuals who have been diagnosed with diabetes, hypertension and hyperlipidemia in Adatıp Hospital Diet Clinic. Information on nutrition habits of individuals will be collected and compared. The aim of the study is to compare the dietary habits of individuals diagnosed with diabetes, hypertension and hyperlipidemia.

PROCEDURES OF THE STUDY:

If you agree to participate in the study, your height, weight and body fat measurements will be made by the researchers in the department's laboratory and a questionnaire will be presented to you.

WHAT ARE THE POSSIBLE BENEFITS OF MY PARTICIPATION?

It will be determined how the results obtained after participation in the study and the status of being diagnosed with different diseases will affect the nutritional habits of individuals.

WHAT ARE THE POSSIBLE RISKS OF MY PARTICIPATION?

No risk is expected for the participants after the participation in the study or the completion of the questionnaire used or in the evaluation of the results.

HOW WILL MY PERSONAL INFORMATION BE USED?

By signing this form, you will only consent to participate in the study. Your credentials will not be used explicitly at any stage of the study. Your measurements and responses to the surveys you fill out will be used for scientific purposes only. Your information will not be shared with anyone or for any commercial purpose.

THE RESOURCE FOR QUESTIONS AND PROBLEMS:

Advisor: Assistant Prof. Dr. Güliz Dirimen Arıkan, M.D-PhD - Yeditepe Uni. Department of Nursing - Phone: 0216 578 00 00-3255

Researcher: Graduate Scholarship Student Fatma Tandoğan - Yeditepe University Institute of Health Sciences Department of Nutrition and Dietetics-Phone: 05355105332

APPROVAL OF PARTICIPATION

I have read and understood this informed consent. I agree to participate in this research and I sign this consent with my own free will. This approval shall not invalidate any applicable laws and regulations. The researcher handed me a copy of this document for me to keep, including the points I will pay attention to during the study.

Volunteer Name Surname	Responsible Researcher Name Surname
Phone	Phone
Date and Signature	Date and Signature

APPENDIX 6. Curriculum vitae

Personal Informations

Name	Fatma	**Surname**	Tandoğan
Place of Birth	Kadıköy	**Date of Birth**	03.07.1992
Nationality	T.C.	**TC ID Number**	14528414010
E-mail	fatma.tandogan92@hotmail.com	**Phone Number**	0535 510 5332

Education

Degree	Department	The name of the Institution Graduated From	Graduation Year
Doctorate			
Master			
University	Nutrition nnd Dietetics	**Yeditepe University**	2016
High school	-		

All the grades must be listed if there is more than one (KPDS, ÜDS, TOEFL; EELTS vs),

Languages	**Grades (#))**

Work Experience (Sort from present to past)

Position	**Institute**	**Duration (Year - Year)**
Nutritionist	Adatip Hospital	2017-
Nurse	Private Pendik Regional Hospital	2015-2016

Computer Skills

Position	**Institute**
Word	Excellent
Excel	Good

Excellent , good, average or basic

Scientific works

The articles published in the journals indexed by SCI, SSCI, AHCI

Articles published in other journals

Proceedings presented in international scientific meetings and published in proceedings book.

Journals in the proceedings book of the refereed conference / symposium

Others (Projects / Certificates / Rewards)
