T.C.

YEDITEPE UNIVERSITY

INSTITUTE OF HEALTH SCIENCES

DEPARTMENT OF NUTRITION AND DIETETICS

THE RELATIONSHIP BETWEEN DIETARY FIBER INTAKE AND KNOWLEDGE LEVELS OF STUDENTS WITH THEIR SELF-REPORTED HEALTH CONDITIONS AT A FOUNDATION UNIVERSITY IN ISTANBUL

MASTER'S THESIS

YEŞİM KÖYLÜOĞLU

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SUPERVISOR

Assist. Prof. Dr. Gözde DUMLU BİLGİN

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Chair of the Jury	Assist.Prof. Dr. Şaziye Ecem ÖRKÜ (Acıbadem Mehmet Ali Aydınlar University)
Supervisor	Assist.Prof. Dr. Gözde DUMLU BİLGİN (Yeditepe University)
Member/Examiner	Assoc.Prof. Dr. İrem KAYA CEBİOĞLU (Yeditepe University)

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 ..... and numbered.....

Prof. Dr. Bayram YILMAZ

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.

03.07.2024
YEŞİM KÖYLÜOĞLU

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DEDICATION

I dedicate this thesis to my late grandmother, Akten Köylüoğlu, and my nephew, Poyraz Konukoğlu.

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ABBREVIATIONS

AACC	American Association of Cereal Chemists
ADA	American Diabetes Association
BP	Blood Pressure
BEBIS	Nutrition Information System
BMI	Body Mass Index
CVD	Cardiovascular Disease
DN	Diabetic Nephropathy
EFSA	European Food Safety Authority
FOS	Fructooligosaccharides
GI	Gastrointestinal
HDL	High-Density Lipoprotein
HRQoL	Health-Related Quality of Life
IR	Insulin Resistance
LDL	Low-Density Lipoprotein
NCD	Non-Communicable Diseases
NHANES	National Center for Health Statistics
RDI	Recommended Daily Intake
RS	Resistant Starch
SCFA	Short-Chain Fatty Acids
SD	Standard Deviation
SF-36	The 36-Item Short Form Health Survey
SPSS	Statistical Package for the Social Sciences
T2DM	Type 2 Diabetes Mellitus
TBSA	Turkey Nutrition and Health Research
TUBER	Turkey Nutrition Guideline
UK	United Kingdom
USA	United States of America
WHO	World Health Organization

ABSTRACT (ENGLISH)

Köylüoğlu, Y. (2024). The Relationshıp Between Dietary Fiber Intake and Knowledge Levels of Students With Their Self-Reported Health Conditions at a Foundation University in Istanbul. Yeditepe University, Institute of Health Science, Department of Nutrition and Dietetics, MSc Thesis, Istanbul.

Dietary fibers are one of the basic elements of a healthy, balanced diet, and they are defined as carbohydrate/carbohydrate-like bioactive components that are resistant to digestion and absorption. It was found that it reduced the risk of cardiovascular disease (CVD), hypertension, stroke, and many gastrointestinal (GI) diseases and was inversely associated with obesity and type 2 diabetes mellitus (T2DM). University students are found to mainly consume processed and ready-made foods that are generally poor in dietary fiber, and in Turkey, dietary fiber intake remains below the recommended daily intake of 25 g. This study aims to measure the relationship between dietary fiber intake and dietary fiber knowledge of students at a private university in Istanbul and compare it with self-reported health status and some anthropometric variables. 290 women, 107 men, and a total of 397 university students participated in this study. Dietary fiber intake was collected by using the 24-Hour Recall Form and the Semi-Quantitative Food Frequency Survey. Dietary fiber knowledge was assessed by the Dietary Fiber Knowledge Survey, and health status was obtained by the 36-Item Short Form Survey (SF-36). It was found that students didn't consume enough dietary fiber, and although there was no significant difference, men were found to consume slightly more dietary fiber than women ($p>0.05$). Knowledge levels of dietary fiber in total, the effect of dietary fiber on health, and the sources of dietary fiber were found to be answered correctly below 50%. However, it was found that dietary fiber knowledge levels had a positive, moderate relationship ($p<0.05$) with dietary fiber intake, and it was observed that dietary fiber intake was not affected by body mass index (BMI), education level, or gender. A very weak but significant relationship was found between dietary fiber intake and total health status outcome.

Keywords: Dietary Fibers, Dietary Fiber Knowledge, University Students, Health Status

ÖZET (TÜRKÇE)

Köylüoğlu, Y. (2024). İstanbul'da Bir Vakıf Üniversitesindeki Öğrencilerin Diyet Lifi Alım Miktarları ve Bilgi Düzeylerinin Kendi Rapor Ettikleri Sağlık Durumları ile İlişkisi. Yeditepe Üniversitesi Sağlık Bilimleri Enstitüsü, Beslenme ve Diyetetik Anabilim Dalı Yüksek Lisans Tezi, İstanbul, 2024.

Diyet lifleri, sağlıklı ve dengeli bir beslenmenin temel unsurlarından biridir ve sindirime ve emilime dirençli, karbonhidrat/karbonhidrat benzeri biyoaktif bileşenler olarak tanımlanır. Kardiyovasküler hastalıklar (KVH), hipertansiyon, felç ve birçok gastrointestinal hastalık riskini azalttığı, obezite ve tip 2 diyabet (T2DM) ile ters ilişkili olduğu bulunmuştur. Üniversite öğrencilerinin çoğunlukla diyet lifi açısından fakir olan işlenmiş ve hazır besinleri tükettikleri ve Türkiye'de diyet lifi alımının önerilen günlük 25 g alımının altında kaldığı görülmektedir. Bu çalışma, İstanbul'daki özel bir üniversitedeki öğrencilerin diyet lifi alımı ile diyet lifi bilgisi arasındaki ilişkiyi ölçmeyi ve bunu, kendilerinin bildirdiği sağlık durumu ve bazı antropometrik değişkenlerle karşılaştırmayı amaçlamaktadır. Araştırmaya 290 kadın, 107 erkek olmak üzere toplam 397 üniversite öğrencisi katılmıştır. Diyet lifi alımı, 24 Saatlik Geriye Dönük Besin Tüketim Kaydı Formu ve Yarı Kantitatif Gıda Sıklığı Anketi kullanılarak toplanılmıştır. Diyet lifi bilgisi, diyet lifi bilgi anketi ile değerlendirilmiştir ve sağlık durumu, 36 Maddelik Kısa Form Anketi (SF-36) ile elde edilmiştir. Öğrencilerin yeterli miktarda diyet lifi tüketmedikleri bulunmuştur ve anlamlı bir fark olmamasına rağmen erkeklerin kadınlara göre daha fazla diyet lifi tükettikleri belirlenmiştir ($p>0,05$). Katılımcıların diyet lifi bilgi düzeyleri, diyet lifinin sağlığa etkisi ve diyet lifi kaynaklarına ilişkin soruların %50'nin altında doğru yanıtlandığı bulunmuştur. Ancak diyet lifi bilgi düzeyleri ile diyet lifi alımı arasında pozitif, orta düzeyde ($p<0,05$) bir ilişkinin olduğu saptanmış ve diyet lifi alımının BKİ, eğitim düzeyi ve cinsiyetten etkilenmediği bulunmuştur. Diyet lifi alımı ile toplam sağlık durumu sonucu arasında çok zayıf ama anlamlı bir ilişki bulunmuştur.

Anahtar Kelimeler: Diyet Lifleri, Diyet Lifi Bilgisi, Üniversite Öğrencileri, Sağlık Durumu

1. INTRODUCTION

The World Health Organization (WHO) defines health as not only the absence of any disease but also "complete physical, mental, and social well-being" (1).

Although the lifespan of this generation is more significant than that of the last generation because of the great improvements in science and technology, (2) non-communicable diseases (NCDs) currently cause the most deaths in the world, regardless of the development level of countries. Some of these diseases include cancer, cardiovascular disease (CVD), obesity, type 2 diabetes mellitus (T2DM), and respiratory diseases. Several factors contribute to the risk of developing NCDs. These established factors are genetic and environmental and might be a result of an impaired immune system (3,4). Increased risk factors for developing NCDs, such as obesity, T2DM, altered lipid profile, and hypertension, are possible with environmental factors such as inadequate dietary habits, smoking, a sedentary lifestyle, and eating above the recommended daily intake (RDI) (3,5). Taking action to prevent NCDs is a way to improve the population's health, especially in early adulthood (6,7).

Obesity is one of the NCDs that increases the risk of developing other NCDs, such as T2DM and CVD (3,8). In the last fifty years, obesity prevalence has increased three times and doubled since 1990, and it is currently estimated that nearly 2.5 billion people are overweight, and 890 million people are considered obese around the world (5,9). In Turkey, according to Turkey Nutrition and Health Research (TBSA), obesity and overweight prevalence over the age of 15 years is 31.5% and 34%, respectively (10). It is evident that higher education levels are negatively correlated with obesity and overweight and positively correlated with increased physical activity. But in contrast, the prevalence of being overweight or obese among university students around the world is higher, including in Turkey (11,12). In addition, besides having bad dietary habits, university students have trouble achieving recommended daily physical activity (13, 14), and university students are five times more likely to gain weight compared to the population, especially in their first year of education (15,16). Supporting this statement, stepping into adulthood, preparing their food, and experiencing significant changes like residential or/and financial alterations, university students adapt unhealthy dietary habits like westernized-diet patterns during their education period (7,17,18).

Which is characterized by low fruit and vegetable consumption, high processed food, saturated fat, and added sugar consumption (18).

A healthy diet consists of sufficient dietary fiber, which humans consume for a very long time (19,20). Dietary fibers are defined as a complex carbohydrate group and lignin that cannot be digested by the human intestines and thus cannot be absorbed (19,21). Dietary fiber is known for its beneficial effects on gut health by increasing motility and preventing constipation. It also improves insulin sensitivity and plays a positive role in lipid and glucose regulation (9). On a preventive basis, it is known to reduce CVD, cancer, T2DM risk, and mortality (9,22).

According to the latest Turkey Nutrition Guideline (TUBER), the recommended amount of daily dietary fiber intake is 25 g for adults, and according to TBSA in Turkey, only 32.8% of the population reaches this recommended amount (10, 23). The foods containing the most dietary fiber are legumes, hard-shelled fruits, grain foods, vegetables, and fruits, respectively (10), but according to studies, fruit, and vegetable consumption has reduced, and fast food consumption has increased among university students in five years following graduation from high school (17,25). In addition, the frequency of skipping breakfast is elevated in those five years, which may result in increased daily energy intake (25). Similarly, in a study conducted in Turkey, skipping breakfast was seen in 47.7% of university students (26).

In some studies conducted in Turkey, dietary fiber information was measured. Among the students who participated in these studies, it was observed that the dietary fiber knowledge of nutrition and dietetics students was high, while the knowledge of dietary fiber was low in students who did not receive any nutrition education (27,28). Similarly, higher educational levels and nutritional interventions effectively improve dietary fiber intake and general nutritional habits (29,30).

University students do not feel at risk because their young age is considered healthy, and the risk of NCDs is low (13,31). However, the nutritional choices they make and the habits they acquire increase the risk of NCDs in the long term (13).

According to all this information, this study aims to measure the relationship between dietary fiber intake and dietary fiber knowledge of students at a private

university in Istanbul and compare it with self-reported health status and anthropometric variables.

2. GENERAL INFORMATION

2.1. Dietary Fiber

Dietary fibers consist of lignin and complex carbohydrate groups found in plants that cannot be digested or absorbed by the human digestive system. When dietary fiber reaches the bowel after passing through the small intestine, it is partly or wholly fermented by the gut microbiota (19,21,32).

Dietary fiber was first named by physicist Hipsley in 1953. However, the importance of dietary fiber has been recognized since Hippocrates (33,34). Hipsley defined dietary fiber as the indigestible "unavailable carbohydrates" that form the cell wall of plants, as described by McCance and Lawrence in 1929, and Hippocrates stated the difference between whole and refined bread by noticing that whole grain bread increased the size of stool (33,35,36).

In the 1970s, the positive effects of dietary fiber on human health began to be researched again and attracted society's attention (37). Dietary fiber has been discussed in recent years under the name "dietary fiber hypothesis." Since a decrease in colon cancer and heart diseases has been observed in the population inversely proportional to increased dietary fiber consumption, "dietary fiber hypotheses" have gained importance and led to many studies on dietary fiber (38). In addition to colon cancer and heart diseases, dietary fiber has been found to be beneficial for many diseases and medical conditions, such as obesity, hypertension, T2DM, hyperlipidemia, insulin resistance (IR), and several gastrointestinal (GI) disorders (38-41).

Many other associations defined dietary fiber throughout these years, but in early 2000, the American Association of Cereal Chemists (AACC) defined dietary fiber as "the edible parts of plants or carbohydrates that are resistant to digestion and absorption in the human small intestine with complete or partial fermentation in the large intestine," and this definition covers the physiological, chemical, and origin of dietary fiber (42,43).

2.1.1. Dietary Fiber Classification and Types

The classification of dietary fiber is done using several approaches. Concerning their structure, polysaccharides are divided into linear and non-linear subgroups, but this is mainly done by their solubility (soluble and insoluble) and fermentability (fermentable and less fermentable or non-fermentable) (9,33,44,45). Soluble fibers become gel-like when they come into contact with water, whereas insoluble fibers are mainly intact as they are (44). Insoluble fibers are categorized as cellulose, hemicellulose, and lignin. They are primarily found in grains and cereals. Soluble fibers are classified as gum, pectin, and mucilages. They are mainly found in vegetables and fruits. However, some foods contain both soluble and insoluble fibers in different amounts (9,44,46).

Dietary fiber is also categorized according to its microbial fermentation status in the large intestine: fermentable and non-fermentable dietary fibers. Fermentable dietary fibers are called prebiotics. Beta-glucan, pectin, guar gum, oligofructose, and inulin are some of these prebiotics. They are converted into organic acids and short-chain fatty acids (SCFA) by the colon microbiota, which are physiologically active metabolites. They are primarily found in legumes and beans (47). Types and sources of dietary fiber are shown in Table 2.1 (46).

Table 2.1. Types and Sources of Dietary Fiber

CHARACTERISTICS	TYPES	FOOD SOURCES
Soluble Dietary Fiber	Gum	Legumes, oatmeal, white dried beans,
	Pectin	Apple, whole grains, legumes, root vegetables, cabbage
	Mucilages	Food additives
Insoluble Dietary Fibers	Cellulose	Whole grains, sweet pea, bran, root vegetables, apple
	Hemicellulose	Whole grains, bran

Lignin	Wheat, vegetables

Arayici ME, Mert-Ozupek N, Yalcin F, Basbinar Y, Ellidokuz H. Soluble and Insoluble Dietary Fiber Consumption and Colorectal Cancer Risk: A Systematic Review and Meta-Analysis. *Nutr Cancer.* 2022;74(7):2412-2425.

2.1.1.1 Soluble Dietary Fiber

Soluble dietary fibers show three main characteristics. These have the ability to dissolve in water, have fermentability, and form a viscous structure. Inulin, guar gum, pectin, β-glucan, arabinoxylans, and psyllium are prominent examples of soluble dietary fibers. Whole grains like barley, oats, and wheat; peas and beans like pinto beans, lentils, split peas, and kidney beans; fruits and vegetables like orange, carrot, and apple; and seeds and nuts like psyllium seed and flaxseed are sources of soluble dietary fibers. Soluble dietary fibers pass through the small intestines without digestion and then ferment in the large intestine (48).

Soluble dietary fibers may or may not form a gel-like substance after being dissolved in water. This results in categorizing soluble fibers by their viscosity. Soluble-viscous dietary fibers are mainly pectin, β-glucan, and psyllium, and soluble non-viscous dietary fibers are mainly inulin and fructooligosaccharides (FOS) (45).

2.1.1.1.A. Pectin

Pectin is a polysaccharide that consists of a complex structure composed of methylated esters of galacturonic acid chains (46,49). It comprises 300-1000 galacturonic acid moieties and contains neutral sugars like D-galactose, L-rhamnose, and L-arabinose. These neutral sugars are linked by 1α→4 linkages (48). Side chains determine the solubility, and the esterification degree determines the formation of the gelling feature of pectin (48,49). When the side chains of pectin are separated, its solubility increases accordingly (49).

Pectin forms the walls of plant cells, and it is immensely water-soluble. In the large intestine, the microflora metabolizes it almost entirely. It also acts as an intercellular adhesion; it reduces gastric emptying rate and affects small intestinal transit times because of its gelling feature (44).

Pectin is commonly found in apples and citrus fruits (oranges and lemons). It is also present in smaller amounts in some legumes, root vegetables like sugar beet, and vegetables like potatoes (44-46,48). 0.5% to 3.5% of pectin is present in citrus fruits, mainly found in the white area of the peel. It becomes water-soluble as the fruit ripens (45,48).

Pectin's high water retention capacity and ability to form a gel-like structure can bind bile acids and ions in the GI tract. Various studies have shown that pectin has beneficial health effects. Some of these include reducing total cholesterol and low-density lipoprotein (LDL) cholesterol, improving lipid metabolism and dumping syndrome, and controlling diabetes (45,48,50).

2.1.1.1.B. Gum

Gums are high-molecular-weight hydrophilic or hydrophobic compounds found in nature. They can form viscous solutions or gels when diluted at very low concentrations in certain solvents. A variety of gums are found in nature that are used in food and other industries, including plant seed gums (guar gum), seaweed gums (carrageenan), exudate gums (acacia gum), mucilage gums (psyllium gum), microbial gums (xanthan gum), and animal polysaccharide gums (chitin or chitosan) (51).

It is mainly composed of polysaccharides. Plants release natural exudate gums in response to stressors like fungus invasion and physical trauma like cuts or incisions. Exudate gums like gum arabic or acacia gum, tragacanth gum, and karaya gum are safe for human consumption, and they are used in the food industry because of their stabilizing, thickening, gelling, and emulsifying properties (51).

Galactomannan gum or guar gum becomes gel-like in water, and it's found in guar beans. Guar beans have a large endosperm and are used as a stabilizer and thickening agent in foods (52). It consists of lengthy linear chains of polysaccharides called galactomannans. They have 50–8000×103 units made up of α-1.6 galactose and β-1.4 mannose in a 2:1 ratio (53).

Studies show that guar gum has beneficial effects on lowering total cholesterol, LDL cholesterol, and blood glucose levels, as well as increasing high-density lipoprotein (HDL) cholesterol (52,54,55). Partially hydrolyzed guar gum, also referred to as guar fiber, has a lower chain length and molecular weight. It has beneficial effects

on lowering symptoms of irritable bowel syndrome in addition to its appetite control effect (53,55).

2.1.1.1.C. Mucilages

Mucilages are large polysaccharides found in nature that are made up of carbohydrates and uronic acid moieties, as well as glycoproteins and other bioactive substances like tannins and alkaloids (56,57,58). L-arabinose, D-xylose, D-galactose, L-rhamnose, and galacturonic acid are the monomer units that make up the majority of its branched carbohydrate structures (58).

Mucilages can dissolve, disperse, and expand in water. They can generate viscous, gelatinous colloidal substances. Additionally, they become partially soluble in water (59,60). They are used in the development and production of pharmaceuticals, and they have applications as adjuvants such as thickeners, binders, disintegrants, texturizing agents, suspending agents, and emulsifying compounds (56,59).

Mucilage can be extracted from various plant parts like seeds, rhizomes, and roots. It has additionally been shown that microorganisms are capable of producing mucilage (57). Flaxseed, chia seed, and yellow mustard are examples of mucilaginous components of the seed coat. Galactomannans, soybean hemicelluloses, and xyloglucans are examples of cell wall material from the endosperm (58).

In the medical industry, mucilage is typically used to treat some skin illnesses on top of complications with the gastrointestinal, respiratory, musculoskeletal, and reproductive systems (58). It has a delaying impact on gastric emptying and glucose diffusion. Because of this, it aids in delaying the digestion and absorption of carbohydrates. This results in reduced blood glucose levels after food consumption (60,61). In addition, mucilages have antibacterial and antioxidant properties and have been linked to benefits for diabetes, cancer, and immunological stimulation (58).

2.1.1.2 Insoluble Dietary Fiber

The majority of dietary fiber derived from plant sources such as fruits, woody plants, and cereal grains is categorized as insoluble dietary fiber. These insoluble dietary fibers are lignin, cellulose, and hemicelluloses. They have functional groups like ether linkages, aldehydes, ketones, carboxylic acids, and phenolics. (44,62,63). The large intestine gut microbiota breaks down insoluble dietary fiber to produce SCFA like butyrate, propionate, and acetate (64). Whole-wheat flour, wheat bran, nuts, legumes, and vegetables, including potatoes, green beans, and cauliflower, have insoluble dietary fiber (65).

Insoluble dietary fiber has several physiological effects. Some of them are inhibition of pancreatic lipase activity, growth inhibition of dangerous bacteria, increased fecal volume, decreased intestinal transit, and support for the growth of intestinal flora (63,64).

2.1.1.2.A. Lignin

Lignin is a strongly branched polymer formed from phenylpropanoid units. It is not a polysaccharide but is a complicated random polymer made up of roughly 40 oxygenated phenylpropane units. These units have undergone dehydrogenative polymerization. They form covalent bonds with fibrous polysaccharides present in plant cell walls (44,45).

Lignin is found chiefly in woody plants, and various methods have been used to remove it. Although it is not considered a carbohydrate, it is categorized as one because it influences the physiological effects of dietary fiber (44,45).

Lignins are present in a wide range of foods, but they are most prevalent in grain bran. They are found in the vessels and secondary tissues of all higher plants (66). According to some studies, certain cancers, including endometriosis cancer, prostate cancer, and breast cancer, may be prevented by lignin (67-69).

2.1.1.2.B. Cellulose

Cellulose is composed of numerous glucose monomers arranged in a linear chain connected by β-(1→4) glycosidic bonding. The hydrogen bonds of microfibrils in cellulose give it its mechanical strength, resistance to biological degradation, poor water solubility, and resistance to acid hydrolysis (44,45).

In the human small intestine, cellulose is insoluble and resistant to the activity of digestive enzymes. It may be fermented by colonic bacteria in the large intestine after the formation of SCFA (45).

It usually exists in apples, whole grains, sugar beets, peas, pineapple core, vegetables, and different types of bran. It is the fundamental structural element of plant cell walls and one of the most frequently applied functional ingredients in food products. In foods, it has applications as a binder, bulking agent, stabilizer, fat substitute, and fat-reducing factor during frying (44,70,71).

Several studies conducted on both humans and animals have shown that cellulose has an anticarcinogenic effect on multiple cancer types, such as colon cancer, stomach cancer, and ovarian cancer (72-74). Another study shows cellulose has a protective effect on breast cancer, especially in the pre-menopause stage (75). It was also found in a study that cellulose positively impacted blood glucose levels because it prompted glycemia to reduce and insulin levels to rise one to one and a half hours after breakfast (76).

2.1.1.2.C. Hemicellulose

Hemicellulose is a polysaccharide composed of 50-200 monomers and has multiple monomer types that exhibit both branched and linear molecules. It is mostly found in plant cell walls. Pentose monomers such as xylose and arabinose and hexose monomers such as galactose, glucose, rhamnose, galacturonic acids, glucuronic acids, and mannose are examples of the monomer units found in hemicellulose (45).

One significant kind of hemicellulose that is categorized as an insoluble food fiber is arabinoxylan, found in barley, rice, corn, wheat, rye, and oats (45,77). The monomers of xylose and arabinose form the arabinoxylan, and colonic bacteria in the human GI tract immediately ferment it. β-1,4-xylosidic linkage connects xylose units to

form the backbone, and α-1,3-linkage attaches arabinose units to produce side chains (45).

Branching and substitution have a significant impact on hemicellulose's water solubility. The more branched and hydrophilic the substituents of hemicellulose are, the more soluble it will be. (78).

In a study, there was a documented inverse association between the amount of bread rich in arabinoxylan and the postprandial glucose response in healthy adult participants (79). In another study conducted on hamsters, by encouraging the excretion of fecal lipids, controlling genes linked to lipid metabolism, and increasing the production of colonic SCFA, they found that arabinoxylan reduces plasma lipid levels (80).

2.1.1.3. Other Dietary Fibers

2.1.1.3.A. β-Glucan

β-glucan is a non-starch polysaccharide, and it is a moderately heterogeneous glucose polymer. It consists of β-D-glucose monomers connected by β(1→3), (1→4), and/or (1→6) glycosidic linkages in both branched and unbranched forms (81).

Oats, barley, bacteria, yeast, algae, and mushrooms are sources of β-glucan, and it is obtained from cereals, which are linked by β-(1→ 3) and β-(1→ 4) glycosidic bonds, as is the case for the term (1→3;1→4)-β-glucan. β-glucan is formed from yeast and mushrooms. Their side chains are made of β-(1→6) links and a backbone made of β-(1→3) linkages, and in barley and oats, β-(1→4) and β-(1→3) glycosidic linkages bind glucose monomers (45,82,83).

β-glucan's strong water binding capacity is responsible for contributing to its physicochemical characteristics, including viscosity, gelation, and solubility. Because of this, β-glucans have a lot of applications in food as stabilizers, thickeners, and fat alternatives (84).

β-glucan has been shown in certain studies to improve the management of diabetes by lowering insulin and postprandial plasma glucose levels in both healthy individuals and diabetic patients (85,86). Other studies showed that β-glucan consumption may considerably decrease serum cholesterol levels, accordingly reducing

the risk of coronary heart disease (87,88). In addition, β-glucan has long been regarded as a significant anticancer agent because of its immune-stimulatory and immunomodulatory properties. Recent research has confirmed that β-glucan can stimulate cancer cell death and prevent cancer cells from proliferating and spreading (89-92).

2.1.1.3.B. Resistant Starch

Resistant starches (RS) may bypass digestion. After consumption, it continues to pass directly to the stomach, then to the small intestine, and then to the colon, where the colon bacteria can ferment it. Despite RS having all of these characteristics, there are different kinds based on the source of their resistance (93). There are four basic classes that RS has been divided into. They are RS1, RS2, RS3, and RS4 (45).

RS1 is the inaccessible starch on a physical level type. Enzymes are unable to access RS1 because of the barrier that is created by the food matrix and protein encasements. Seeds and whole grains are common sources of RS1 (45,94).

RS2 is distinguished by its natural granular form. It is mostly present in some raw foods like green bananas and raw potatoes. These sources have a high amylose concentration, which causes a densely packed granular structure that minimizes enzymatic activity (45,94).

RS3, or retrograded starch, is a substance that develops after some meals are cooked and chilled. The starch molecules are realigned and recrystallized due to this chilling process. This process increases their resistance to enzyme degradation. The main food sources of RS3 are cooked and cooled rice, pasta, and potatoes (94).

RS4 is made up of artificially altered carbohydrates that aren't found in food in nature. To make starch molecules less prone to digestion, a wide range of industrial methods substitute or cross-link them (94).

The fermentation of RS in the large intestine is primarily responsible for its possible health advantages and physiological effects like reduction in fasting triglyceride and cholesterol levels (45,94). The higher intestinal viscosity of digested food caused by resistant starches slows the interactions between fatty acids and sugars,

and it is one of the biological processes that explain the lowering of cholesterol levels (45).

RS has also been shown in animal experiments to have positive effects on fasting plasma glucose concentrations through improved sensitivity to insulin and production (95-97).

2.1.2. Recommended Dietary Fiber Intake

Guidelines for consuming sufficient amounts of dietary fiber vary depending on the age group and region. However, according to several studies, adults are generally advised to consume between 25 and 30 g or more every day (98, 99). According to TUBER, in Turkey, it is recommended for adults to consume 25 g of dietary fiber daily, and similarly, according to the European Food Safety Authority (EFSA), adults are advised to consume at least 25 g of dietary fiber daily (23,100). According to TUBER, there is no daily dietary fiber intake recommendation for children under the age of 2 years, and recommended daily dietary fiber intake increases by age until the age of 18 years (23). The recommended daily dietary fiber intake for age and gender is shown in Table 2.2. (23).

Table 2.2. The Recommended Daily Dietary Fiber Intake for Age and Gender (g/day)

Recommended Daily Dietary Fiber Intake by Gender		
Gender	**Age (years)**	**Dietary Fiber (g)**
Women	2-3	10
	4-6	14
	7-11	16
	11-14	19
	15-17	21
	18-50	25
	51-64	25
	65-70	25

	≥70	25
Men	2-3	10
	4-6	14
	7-10	16
	11-14	19
	15-17	21
	18-50	25
	51-64	25
	65-70	25
	≥70	25

Türkiye Beslenme Rehberi, TÜBER 2022, T.C. Sağlık Bakanlığı Yayın No: 1031, Ankara 2022.

2.1.3. Dietary Fiber Amounts Found in Foods

Dietary fibers are found only in plants, and according to the TBSA, the food groups most fiber-containing are grains, fruits (more in hard-shelled fruits), legumes, and vegetables (10,44). Approximately 50% of the dietary fiber consumed in Western countries comes from cereals, making them one of the main sources. The remaining 3% of dietary fiber consumption comes from various small sources, and fruits and vegetables account for 30% to 40% (44). The dietary fiber contents of various foods are shown in table 2.2. (44,101).

Table 2.3. Dietary Fiber Content of Various Foods

	Dietary Fiber (g/100 gram)		
Source	**Total Fiber**	**Soluble Fiber**	**Insoluble Fiber**
Legumes			
White bean	17,7	4.3	13.4
Cranberry bean	24.7	-	-
Kidney beans	24.7	-	-
Lentils	11.4	-	-
Peas, raw	21.6	-	-
Chickpeas, raw	12.2	-	-
Green beans	1.9	0.5	1.4

Grains			
Barley, hulled	17.3	-	-
Wheat bran	42.8	-	-
Wheat germ, crude	13.2	-	-
Wheat	12.6	2.3	10.2
Oat	10.3	3.8	6.5
Rice, uncooked	1.3	-	-
Bulgur wheat, dry	12.5	-	-
Corn	13.4	-	-
Seeds and Nuts			
Flaxseed	22.3	12.2	10.1
Chia Seed, dried	34.4	-	-
Quinoa, uncooked	7		
Sesame seed	16.9	-	-
Coconut	9	0.5	8.5
Pistachio, roasted	8	0.5	7.5
Walnut	6.7	-	-
Peanut	8.5	-	-
Hazelnut, blanched	11	-	-
Almonds	11.2	1.1	10.1
Fruits			
Fig, dried	9.8	-	-
Apple	2	0.2	1.8
Apple, pealed	1.3	-	-
Plum	1.4	-	-
Banana	1.7	0.5	1.2
Pear	3	1	2
Kiwi	3.4	0.8	2.6
Watermelon	0.5	0.2	0.3
Melon	0.9	-	-
Orange	1.8	1.1	0.7
Peach	1.9	0.9	1
Strawberry	2.2	0.9	1.3
Raspberries	6.5	-	-
Avocado	6.7	-	-
Vegetables			
Potatoes, pealed	1.3	0.3	1
Tomatoes, raw	1.2	0.4	0.8

Spinach, raw	2.6	0.5	2.1
Eggplant	6.6	1.3	5.3
Okra	4.3	1.3	3
Carrot, raw	2.5	0.2	2.3
Zucchini	1	-	-
Cauliflower, raw	1.8	0.7	1.1

Dhingra D, Michael M, Rajput H, Patil RT. Dietary fibre in foods: a review. J Food Sci Technol. 2012;49(3):255-266.

United States Department of Agriculture Agricultural Research Service. USDA Food Composition Databases.

2.1.4. Dietary Fiber and Health

Dietary fiber can change human physiology in a variety of ways and have positive effects on health. Knowledge of the health advantages of dietary fiber has changed within the past few years (9,102). Dietary fiber has been shown to have numerous benefits in research (103-105). Consuming a significant amount of dietary fiber lowers the chance of getting diseases like obesity, cancer, T2DM, hypertension, coronary heart disease, stroke, and several gastrointestinal issues like diverticular disease, hemorrhoids, and constipation (39,69).

Dietary fiber consumption and all-cause mortality were evaluated in a large-scale population-based cohort study in Japan. They discovered an inverse relationship between the all-cause mortality rate and dietary fiber (106). Similarly, a different study reported that although, after age 50, the correlation between long-term dietary fiber consumption and all-cause mortality became less significant, an added 10 grams of recent dietary fiber consumed daily decreased mortality from coronary heart disease by 17% and from all-cause mortality by 9%. (107).

Zhang et al. conducted a cohort study, and they concluded that higher dietary fiber consumption among individuals over or at the age of 65 with hypertension was substantially linked to a decreased all-cause and cardiovascular mortality (108). In a meta-analysis prospective cohort study, 15 studies were examined. They aimed to determine whether there is any relationship between dietary fiber intake and mortality due to CVD and all types of cancer. Their report suggests that increased dietary fiber intake had an inverse association with deaths from all types of cancer and CVD (109).

Several studies done with children showed low dietary fiber is associated with constipation, and consumption of dietary fiber is an effective solution for it (110-113). In another study, 10 g of soluble dietary fiber (β-glucan) was taken daily by 17 obese women at risk of IR. The results indicated that the consumption of 10 g of β-glucan had a positive impact on the postprandial insulin response (114). Similarly, in another study, participants who were overweight or obese and consumed 10.4 g of oat fiber three times a day showed greater insulin sensitivity (115). In addition to these studies, a cross-sectional study aimed to correlate the relationship between dietary fiber intake and the health status of hypertension patients, as well as anxiety, blood pressure (BP), and hypertension. They reported that a lower health-related quality of life (HRQoL) is associated with a lower dietary fiber intake (116).

2.1.4.1. Dietary Fiber and CVD

CVD is one of the leading causes of death worldwide. A variety of conditions affecting the heart and blood vessels are included in CVD (117). For an extensive time, diet has contributed to the etiology of CVD and atherosclerosis in the general population (118). It is crucial to prevent CVD by altering modifiable risk factors, such as nutrition and lifestyle (117). An increase in research from epidemiological studies has demonstrated that high dietary fiber consumption is negatively correlated with the development of CVD (119-121). A cohort study conducted in the USA showed a significant correlation between increasing fiber consumption and a 31% decreased risk of all-cause mortality from pre- to post-myocardial infarction (122).

Reductions in blood pressure and cholesterol levels have been primarily linked to soluble dietary fibers' beneficial impacts on health (123). Supportingly, a meta-analysis was conducted on 67 controlled trials, and the aim was to study the effect of some dietary fiber interactions on cholesterol levels. They concluded that small but considerable reductions in LDL and total cholesterol were linked to daily 2-10 g of soluble fiber intake (124). Another meta-analysis and systematic review study states that increasing fiber intake lowers blood pressure at both the systolic and diastolic levels in adults diagnosed with hypertension (125).

Overall, dietary fiber consumption can influence the appearance of cardio-metabolic risk by postponing the absorption of carbohydrates, elevating satiety, reducing LDL cholesterol, improving peripheral insulin sensitivity, and ameliorating postprandial hyperglycemia (118).

2.1.4.2. Dietary Fiber and T2DM

Expanding research interest is being shown in the therapeutic effects of dietary fiber, particularly as it relates to T2DM, one of the most researched dietary patterns (126). According to several meta-analyses, increased consumption of cereal fiber is inversely correlated with the risk of T2DM (127-129). Similarly, in a clinical trial in individuals with T2DM, an intake of 50 g of soluble dietary fiber, double the amount advised by the American Diabetes Association (ADA), improved glycemic control and reduced hyperinsulinemia in comparison to the same group's consumption of the recommended daily dietary fiber intake by the ADA, which is 25 g per day (130). On the contrary, despite relatively minor side effects such as diarrhea, bloating in the abdomen, and flatulence, no evidence from a meta-analysis was found to clarify the harmful effects of fiber concerning a specific dose, and therefore, further research is needed to determine the impact of dietary fiber, whether from supplements or the diet, on insulinemic and glycemic responses, as well as the tolerated maximum limit (126).

Data on 5964 T2DM patients was gathered in a cross-sectional study in the USA. Among the participants, diabetic nephropathy (DN) affected 36.7%. They concluded that one of the best methods for managing and preventing DN may be to increase dietary fiber intake (131). In 2018, 16 meta-analyses were reviewed as part of an umbrella review of a meta-analysis—research aimed to assess the relationship between dietary fiber and T2DM. There were significant decreases in fasting blood glucose in the two meta-analyses that examined clinical trials where people with T2DM received soluble fiber supplements. Substantial reductions in fasting insulin levels were seen in another two meta-analyses that studied the impact of β-glucan supplementation on these changes (132).

In a cohort study conducted in Japan, the impact of dietary fiber consumption on the incidence of diabetes was observed for 14 years in healthy adults. A total of 280 participants developed T2DM throughout this period. This recent study concluded that a decreased risk of T2DM was linked to a greater consumption of dietary fiber (133).

Another cohort study that followed participants for two years studied the association between different kinds of dietary fiber (total dietary fiber, soluble and insoluble fiber) and a range of NCDs, including diabetes. They concluded that the risk of T2DM was inversely correlated with every type of dietary fiber researched (134).

Similarly, in another cohort study conducted in Hawaii, participants were followed for 14 years. The effects of dietary fiber on diabetes and the glycemic index were investigated during this research. As a result, it was measured that total dietary fiber intake significantly reduced the risk of diabetes in both male and female participants, especially grain fiber, which had a reducing effect of up to 10% (135).

2.1.4.3. Dietary Fiber and Cancer

A high dietary fiber intake has been demonstrated through several meta-analyses to be protective against the development of multiple forms of cancer (136). Various bioactive substances, such as SCFA, are produced during the fermentation of dietary fibers in the GI tract and may offer protection against cancer by promoting cancer cell apoptosis (137). Assessments of the pathways of the assorted types of fiber impact cancer cells have revealed that some fibers reduce tumorigenesis by managing the growth, longevity, and apoptosis of cells. Dietary fibers have also been shown to increase the generation of pro-apoptotic factors and suppress transcription and anti-apoptotic cell-proliferating chemicals (69).

In 2023, a randomized controlled trial was carried out in Taiwan to investigate the correlation between colon cancer patients' following surgery symptoms and their experiential learning of dietary fiber. Colonic symptoms following colon surgery were strongly connected with experiential learning throughout the hospital stay and positively correlated with dietary fiber consumption (138). Similarly, broad, prospective research as part of a population-scale screening trial conducted in 2015 studied the dietary fiber intake and the likely development of colorectal cancer by occurrence, incident, and recurrent adenoma. A substantially reduced likelihood of occurrence of distal colorectal adenoma was linked to an elevated total dietary fiber consumption.

Supportingly, a lower risk of distal colon cancer was observed with an increased total fiber consumption, even though the association was not statistically noteworthy for colorectal cancer overall. In conclusion, they stated the fiber derived from fruit or

cereals was especially notable for its protective properties (139). Two studies conducted in 2020 investigated the relationship of whole-grain foods with colorectal and bladder cancer and found that increased consumption of whole-grain foods was inversely associated with bladder and colorectal cancer (140,141).

Two meta-analyses were conducted to investigate the correlation between dietary fiber consumption and ovarian cancer, including 19 and 17 articles separately. Both meta-analyses found that a lower incidence of ovarian cancer is linked with higher dietary fiber consumption (142,143).

Two meta-analysis studies investigating the relationship between breast cancer and dietary fiber in 2011 and 2012 concluded that increased dietary fiber intake reduces the risk of breast cancer. (144,145). Higher dietary fiber consumption is associated with esophagus, prostate, gastric (stomach), and pancreatic cancer (146-149).

2.1.4.4. Dietary Fiber and Obesity

According to 2017 data from TBSA, in Turkey, 39.9% of men and 27.6% of women are considered overweight, and 24.6% of men and 39.1% of women over the age of 15 are considered obese (10). WHO estimates that 890 million people are obese and 2.5 billion people are overweight over the age of 18 as of 2022. Over 34 years, the adult obesity rate has doubled (1). Complex interactions are involved in the regulation of body weight. The microbiome of the gut has a great effect on every facet of energy balance. Clinical and animal studies have provided evidence regarding the favorable impact of dietary fiber on the metabolic process and obesity (150). The aim of a review study was to determine the underlying mechanism of how dietary fiber lowers the risk of conditions associated with obesity. Dietary fiber both inhibits and treats conditions related to obesity. They found that reduced macronutrient absorption and increased satiety are two of the preventive mechanisms. The scientific explanation for why high-fiber diets prevent obesity and play a part in treating obesity may be explained by modifications in the gut flora and SCFA (151). A study was conducted on obese mice fed a high-fat diet to assess the biological effects of dietary fiber from pomelo peels on the regulation of the gut flora and inhibiting obesity. Treatment with dietary fiber extracted from pomelo peels considerably decreased the amount of fat that accumulated in the liver of obese mice in addition to their weight gain (152).

A cohort study investigated the relationship between long-term weight gain and dietary fiber, refined grains, and whole grains. It was observed that women who received more whole grains weighed less than those who consumed fewer of them. They concluded that consuming whole grains and high-fiber foods negatively correlated with increased weight while consuming refined grains was favorably correlated (153). In another cohort study, the correlation between increases or decreases in body weight, the circumference of the waist, and dietary fiber (fruit and vegetable, cereal, and total) was examined. Total dietary fiber consumption was negatively correlated with waist circumference and body weight fluctuations following an observation period of approximately 6.5 years (154).

Some research shows that increasing the consumption of soluble or insoluble fiber promotes postmeal satiety and reduces recurrent appetite when there is a stable energy intake. However, the physiological impacts of dietary fibers vary and are influenced by their physicochemical characteristics. The optimal way to use various fibers in the management of obesity is still up for debate (150,156).

2.1.4.4. Dietary Fiber and Microbiota

Dietary fiber can have a significant role in the diversity, richness, and content of the microbiome by offering a multitude of sources for fermentation events that are carried out by particular bacterial species that have the enzyme mechanism required to break down these complex carbohydrates (157).

Since human enzymes cannot break down food fibers, they are transferred to the lower gut and utilized by the intestinal microbiota, which is primarily made up of bacteria that live in the colon (158).

In humans, age, activity, and antibiotic use all have a big impact on an individual's microbial profile. Diet is also an important factor. Additionally, human gut microbiota patterns change in metabolic disease states such as obesity, T2DM, and CVD, as mentioned above (159).

Reduced consumption of fiber in the diet has been linked to changes in gut microbiota. These include the generation of these metabolites themselves, specific taxonomic alterations (especially among microorganisms engaged in fermentation and the formation of SCFA), and an overall decrease in the diversity of gut microbes (160).

A study investigated how young, healthy individuals' gut flora was affected by a varied dietary fiber intake. A randomized crossover trial assessing the effects of resistant malt dextrin, polyglucan, and inulin on the makeup and bacterial abundances of the gut microbiota involving 12 young and healthy adults was conducted. Consequently, they discovered that dietary fiber intervention greatly raised the relative abundance of good bacteria, which are connected to lipid and glucose metabolism; in contrast, several harmful bacteria were shown to be less prevalent. The gut microbiota's structure was impacted positively by dietary fiber intervention (161).

2.1.5. Dietary Fiber and Adverse Side Effects

Existing evidence supports diets high in fiber have major health benefits, but it is unclear how increasing fiber may affect one's satiety, comfort in the gastrointestinal tract, and appetite. It is also not always feasible or accepted (162). Likewise, specifically in the initial phases of dietary modifications, GI function alterations may result in a higher dietary fiber intake (163). This situation can involve altered bowel habits (difficulty defecating, increased flatulence, altered feces) and stomach discomfort (bloating, cramps, and feeling overly full) (164).

Supplementing with high-dose dietary fiber needs to be approached with caution. This condition is essentially true if such a diet is suggested for children, individuals with nutritional abnormalities, or expectant or breastfeeding mothers (165). Certain disorders, like Crohn's disease or intestinal blockage of the digestive tract, require limiting fiber consumption while under the supervision of a medical professional (166).

In conclusion, medical specialists advise a diet high in high-fiber foods. This advice may be suitable for most patients, but some individuals should refrain from going excessively on this diet (166).

2.1.6. Dietary Fiber Knowledge and Awareness

Individuals with a greater understanding of food and its constituents, like dietary fiber, could be more capable of making educated choices regarding their fiber intake. Knowledgeable consumers will be able to choose foods high in dietary fiber and benefit from the health effects that come with them. Thus, a key challenge to establishing good eating habits may be a lack of awareness (167).

Higher levels of education are not necessarily the only sociodemographic feature linked to increased knowledge of dietary fiber; female gender, urban surroundings, and middle age are also connected with higher levels of knowledge (167). A study conducted in Bangladesh aimed to evaluate dietary fiber knowledge, attitudes, and practices in a sample of urban and rural areas. As a result, participants in urban areas were more knowledgeable about dietary fiber (96%) than those in rural areas (74%); 15% of respondents were clueless about the topic (168).

Socioeconomic disparities are thought to be greatly influenced by dietary variations and their possible protective aspects. For example, eating more fruits and vegetables has a particularly big impact on high rates of morbidity and mortality among lower socioeconomic societies (169). A study with the aim of promoting knowledge of the dietary habits and social settings of adolescents with regard to fiber was conducted. The researchers took individual aspects and the overall socioeconomic level into account. As a result, researchers found that adequate dietary fiber intake was adversely correlated with low and average socioeconomic levels. This correlation was related to parents with less education, living in a rural area, and having a lower financial income (170).

A study was carried out in 10 countries in America, Europe, and Africa, including Turkey, to assess the relationships between various sociodemographic factors like gender, education level, age, living circumstances, or nation, and the levels of dietary fiber knowledge. Results show general fiber knowledge was determined to be moderate. Turkey was found to have the most comprehensive knowledge of dietary fiber among other countries included in the study. Individuals show a high degree of dietary fiber knowledge, which mostly consists of women (71.8%), those over 40 years of age (35.3%), those with a university degree (61.1%), and those who live in urban areas (85.4%) (171).

A general understanding of dietary fiber, knowledge, and awareness of dietary fiber's health effects and food products are linked to perusing food product labels, learning about dietary fiber, and generally reading labels (172).

2.2. Nutrition in University Students

University students are the initial individuals to enter the adult phase following adolescence (173,174). A new chapter in their nutritional experience begins when they leave the household conditions they grew into and get used to. They become more welcoming to outside influences, and they start making decisions independently (173).

Nutrition is vital for every aspect of society and is particularly crucial for university students (175). Unhealthy and irregular eating habits might arise with the start of the university experience due to newly formed social circles, academic difficulties, housing issues, challenges with finances, and other factors like insufficient knowledge of nutritional principles. Poor eating habits can lead to various health issues besides malnutrition or overnutrition (174,175). It is known that a sedentary lifestyle devoid of physical exercise and unhealthy eating patterns throughout childhood and adolescence elevates the risk of chronic illnesses like obesity, T2DM, metabolic syndrome, and CVD in adulthood (176).

The dietary habits of students are also greatly influenced by the food environments on campuses at universities. Accessibility and availability of nutritious meals are critical determinants of dietary choices and the general standards of diets (175). A few studies have shown that students eat one meal per day, tend to skip meals, pay barely any consideration to what they are eating, and eat a significant amount of foods like Turkish bagels and sandwiches (173,174).

2.2.1. Nutrition Knowledge in University Students

Individuals need to be adequately educated about nutrition if they are aiming to maintain healthy eating patterns, choose nutritious foods, and lead healthy lives. A nutrition education that is appropriate for providing nutritional knowledge makes it possible (177). Few studies demonstrate that choosing healthier foods is easier when a person has a deeper understanding of food and nutrition (178,179). An important factor in encouraging healthy practices is an abundance of communication channels that facilitate quick access to health-related information. However, it should be considered that inaccurate or conflicting information is broadly accessible, and it might misguide people about their behaviors and decisions (178,180).

A cross-sectional study was carried out in the United Kingdom (UK) between 2017 and 2018. The goal was to identify the factors that impact nutritional knowledge, potential variables affecting knowledge, and nutritional understanding among university students. Participant's responses revealed that a considerably small number of them correctly answered the questions about fat and fiber. This outcome suggests that they had gaps in their understanding of the nutrients in question and the foods that contain them (181). This insufficient knowledge could strengthen the results of an earlier study that found university students to have poor dietary fiber intake (182).

2.2.1.2. Dietary Fiber Knowledge in University Students

A study on Turkish students' knowledge of dietary fiber was carried out in Turkey to validate a dietary fiber knowledge survey. The participants were divided into two groups. The first group consisted of undergraduate students who had completed a 14-week nutrition course, and the second group had not participated in any nutrition-related education. The results revealed that the students who completed a 14-week nutrition course differed more from the non-participating students. A significant percentage of students did not know the nutritional guidelines about dietary fiber. Also, a large number of students lacked a basic understanding of the foods having dietary fiber. It is highly likely that the insufficient knowledge of these students hinders them from consuming nutritious foods and meeting the daily dietary fiber requirement. People are incapable of adopting healthier eating habits if they lack the necessary knowledge (28). Supporting the study above, some similar studies suggest that university students tend to be unaware of the dietary fibers in foods or how dietary fiber affects health (181,183).

2.3. University Students and Health Status

WHO defines health as "complete physical, mental and social well-being" in addition to the absence of any diseases (1). Mental and physical well-being is affected by several factors. These factors include age, sex, gender, ethnicity, and socioeconomic status (184). The difficulties and concerns that university students face are different from those facing other demographic groups. These students commonly deal with financial constraints on top of the stress of achieving academic goals. Accordingly, university students were shown to have a less positively reported quality of life when they were compared with their employed peers (185-187).

In addition, low psychological well-being and mental health issues are prevalent among university students. This is concerning because some studies accept that this demographic group is more susceptible to diseases (188-191). It was also found that among these students, it was significantly less common to seek medical attention for psychological issues (185).

One accepted method of evaluating people's health is to ask them to report their own health. Self-reported health status is a useful indicator of both subjective and objective well-being, and it is used as a practical method for assessing health in large-scale questionnaires. Several health conditions have been demonstrated to have great reliability, validity, and predictive capacity when it comes to self-reporting of health (185).

There is no study aiming to assess and compare dietary fiber intake and its knowledge and their relationship with self-reported health status among university students. Considering all this information, knowing the positive health effects of dietary fiber and the importance of its knowledge, assessing the relationship between university students' dietary fiber intake, and comparing their knowledge and self-reported health status will add to the literature.

3. MATERIALS AND METHODS

3.1. Design and Aim

The study received approval from the Yeditepe University Clinical Research Ethics Committee on 08.12.2023, stating that it is both scientifically and ethically appropriate to be conducted. The aim of the research is to measure the relationship between dietary fiber intake levels and dietary fiber knowledge of students at university and to compare this with their self-reported health status. It is a cross-sectional descriptive study.

3.2. Place, Time, and Sample Selection of the Research

The research was conducted at Istanbul Yeditepe University 26 Ağustos Campus. The research population was designed to include Yeditepe University students who were 18 years of age or older during the 2023–2024 academic year. Students studying nutrition and dietetics were excluded from the study due to their high level of knowledge in the field of study. With the exception of the Department of Nutrition and Dietetics at Yeditepe University, all students are considered the population. The sample calculation with a known population using the random sampling method aims to reach at least 376 participants with a 95% confidence level of ± 5% acceptable error in a population size of n = 18 141.

Inclusion criteria;

- Being an undergraduate student registered at Yeditepe University,
- Being 18 years or older
- Volunteering to participate in the study,
- Not being a student of the Department of Nutrition and Dietetics

Exclusion criteria;

- Not volunteering to participate in the study,
- being under 18 years old
- Being a Nutrition and Dietetics student,
- Being a graduate student.

3.3. Data Collection of the Research

3.3.1. Data Collection Form

It contains questions created to collect participants' health and demographic information. The weight and height data were obtained by self-reporting by students. Body mass index (BMI) (kg/m^2) was calculated using height and weight data from the collected data. When calculating, the formula body weight (kg) / height (m^2) and the WHO classification are used for the BMI range.

3.3.2. 24-Hour Dietary Recall (24 HR) Form

24-hour Dietary Recall (24 HR) was taken based on the individuals' daily food consumption. Total dietary fiber, soluble dietary fiber, and insoluble dietary fiber amounts taken in the daily diet were analyzed using the Nutrition Information System, version 9 (BeBiS) developed for Turkey.

3.3.3. The 36-Item Short Form Health Survey (SF-36)

The 36-item short-form health survey (SF-36) was developed by Ware in 1987 (192), and the reliability and validity study of the Turkish version of SF-36 was conducted by Koçyiğit et al. (193). The survey consists of 36 questions, and it is evaluated on an 8-scale scale. Scoring the survey is a two-step process. First, previously coded numerical values were recoded according to the scoring key. All items were scored so that a higher score described a more positive health status. Each item is scored between 0 and 100, with the lowest and highest possible scores being 0 and 100, respectively. Points represent a percentage of the total possible score that can be achieved. In step 2, items from the same scale were averaged to create 8 scale scores. Blank items (missing data) are not taken into account when calculating scale scores. Scale scores represent the average of all items on the scale answered by the respondent.

3.3.4. Dietary Fiber Knowledge Questionnaire

The Dietary Fiber Knowledge Questionnaire was developed by Deniz and Alsaffar (28) in 2012. It consists of two sections and consists of 18 questions in total, 9 questions in each section. Each statement has three possible answers (True/False/Unsure). There is only one correct answer to each question. Questions are numbered as true and false

and converted to 1 and 0. Answers selected as "unsure" were counted as incorrect. This survey determined how much the participants knew about dietary fiber.

3.3.5. Adult Semi-Quantitative Food Consumption Frequency Questionnaire

The Adult Semi-Quantitative Food Consumption Frequency Questionnaire was developed by Güneş et al. (194) in 2015 to evaluate the adult Turkish population's dietary intake. It consists of 229 items and 7 sections. It is used to determine how often and in quantity the participants consume the foods included in their general diet and provides us with information about their daily energy, carbohydrate, fat, protein, and dietary fiber intake. The nine different groups of >6/day, 4-5/day, 2-3/day, 1/day, 5-6/week, 2-4/week, 1/week, 1-3/month, and 1-none/month were used to record the frequency of food consumption. The amount of fiber taken with the diet was evaluated considering the TÜBER 2022, and other dietary components were calculated with the help of BeBiS version 9.

3.4. Evaluation of Data

Data collection involved distributing surveys, where participants self-reported their responses. While surveys provide direct insights from individuals, the length of the surveys may influence participant responses, as fatigue or time constraints could lead to incomplete or rushed answers, which is a limitation. With the 24-Hour Dietary Recall (24 HR) Form and Adult Semi-Quantitative Food Frequency Questionnaire, the total energy, protein, carbohydrate, fat, and dietary fiber intake of the students was measured using the Nutrition Information System (BEBIS) version 9, and the daily dietary intake of the students was calculated by taking the average of the two results.

The data obtained from the research were analyzed using the Statistical Package for the Social Sciences (SPSS) 25.0 statistical program. Numerical variables, such as mean, standard deviation (SD), median, lower and upper values, and categorical variables, will be displayed as numbers (n) and percentages (%). All analyses determine the confidence interval as 95%, and the results will be considered statistically significant for $p < 0.05$. Skewness-Kurtosis measured normality distributions of parameters. In statistical evaluations, according to the characteristics and normality of the variables, Pearson correlation and Spearman correlation were used to examine the relationships that are compatible. The chi-square (X^2) test was used to compare categorical variables, and the

Mann-Whitney U test and Independent Sample T-Test were used for comparisons between two independent groups.

4. RESULTS

Table 4.1. Gender, Age, and Marital Status Distribution

		n	%
Gender	Women	290	73.0
	Men	107	27.0
Age	18-22	324	81.6
	23-27	71	17.9
	28-36	2	0.5
Marital Status	Single	393	99.0
	Married	4	1.0

A total of 397 students, 290 (73%) women and 107 men, participated in the study. 81.6% of the students were between the ages of 18-22, 17.9% were between the ages of 23-27, and 0.5% were between the ages of 28-36. The marital status of 99% of the students was single, and 1% was married. The highest education level, 91.9% of the students, was in high school, and 8.1% was in university (Table 4.1).

Table 4.2. Average of Anthropometric Measurements and Age

	Gender	n	Mean
Weight (kg)	Women	290	60.08 ± 11.19
	Men	107	79.75 ± 13.86
	Total	397	65.38 ± 14.81
Height (cm)	Women	290	165.87 ± 6.16
	Men	107	180.18 ± 6.70
	Total	397	169.73 ± 8.95
BMI (kg/m^2)	Women	290	21.80 ± 3.68
	Men	107	24.51± 3.72
	Total	397	22.53 ± 3.88
Age	Women	290	20.7 ± 1.7
	Men	107	21.3 ± 2.7
	Total	397	20.8 ± 2.0

The average weight of women was 60.08 ± 11.19 kg, the average weight of men was 79.75 ± 13.86 kg, and the total average weight was 65.38 ± 14.81 kg. The average BMI of women was 21.80 ± 3.68 kg/m^2, the average BMI of men was 24.51 ± 3.72 kg/m^2, and the total average BMI was 22.53 ± 3.88 kg/m^2. The average age for women was 20.7 ± 1.7, for men 21.3 ± 2.7, and the total average was 20.8 ± 2.0. (Table 4.2).

Table 4.3. Other Findings Regarding Health-Related Characteristics of Individuals

		Gender				
		Women	**Men**	**Total**		
		n (%)	**n (%)**	**n (%)**	**X^2**	**p**
Disease Status	Yes	58 (20)	17 (15.9)	75 (18.9)	0.863	0.353
	No	232 (80)	90 (84.1)	322 (81.1)		
Medication Use	Yes	57 (19.7)	7 (6.5)	64 (16.1)	9.939	0.002*
	No	233 (80.3)	100 (93.5)	333 (83.9)		
Food Allergy Status	Yes	35 (12.1)	3 (2.8)	38 (9.6)	7.752	0.005*
	No	255 (87.9)	104 (97.2)	359 (90.4)		
Food Supplement Use	Yes	71 (24.5)	27 (25.2)	98 (24.7)	0.024	0.878
	No	219 (75.5)	80 (74.8)	299 (75.3)		
Alcohol Use	Yes	152 (52.4)	58 (54.2)	210 (52.8)	0.101	0.751
	No	138 (47.6)	49 (45.8)	47.1 (47.2)		
Smoking Status	Yes	91 (31.4)	32 (29.9)	123 (31)	0.079	0.778
	No	199 (68.6)	75 (70.1)	274 (69)		

***p<0.05 **p < 0.01**

In Table 4.3, the students' disease status, medication use, food allergy status, food supplement use, alcohol, and smoking status were evaluated. It was found that 18.1% of students had a disease. There was no statistically significant difference between genders ($p > 0.05$).

16.4% of students were using medication, while 9.6% had food allergies. A statistically significant difference between genders regarding medication use ($p = 0.002$) and food allergy ($p = 0.005$) was found.

While 24.7% of the students were using food supplements, 75.3% did not use any food supplements. There was no significant difference between genders regarding food supplement use ($p > 0.05$).

52.8% of students were using alcohol, and 31% smoked regularly. There was no significant difference between genders regarding alcohol and smoking status ($p > 0.05$).

Table 4.4. Findings Regarding the Meal Counts by Gender

	Gender		
Meal Counts	**Women**	**Men**	**Total**
	n (%)	**n (%)**	**n (%)**
1	6 (2.1)	0 (0)	6 (1.5)
2	108 (37.2)	39 (36.4)	147 (37.0)
3	137 (47.2)	54 (50.5)	191 (48.1)
4	26 (9.0)	11 (10.3)	37 (9.3)
5	10 (3.4)	2 (1.9)	12 (3.0)
6	3 (1.0)	1 (0.9)	4 (1.0)
Total	290 (73.0)	107 (23.0)	397

In Table 4.4, the number of daily meals of students is shown by gender. 1.5% of individuals consumed 1 meal a day, 37.0% consumed 2 meals a day, 48.1% consumed 3 meals a day, 9.3% consumed 4 meals a day, 3% consumed 5 meals a day, and 1% consumed 6 meals a day. Individuals were mostly found to be consuming 2 and 3 meals a day (37% and 48.1%, respectively). There was no significant difference in meal frequency between genders ($p > 0.05$).

Table 4.5. Findings Regarding the Supplementation Intake by Gender

		Gender				
		Women n (%)	**Men n (%)**	**Total n (%)**	**X^2**	**p**
Do you take vitamin supplementation regularly?	Yes	145 (50)	50 (46.7)	195 (49.1)	0.335	0.563
	No	145 (50)	57 (53.3)	202 (50.9)		
Do you take mineral supplementation regularly?	Yes	109 (39.6)	39 (36.4)	148 (37.2)	0.043	0.835
	No	181 (62.4)	68 (63.6)	249 (62.7)		

***p<0.05**

When the participants were asked about their use of vitamin and mineral supplements, it was found that 49.1% used vitamin supplements and 37.2% used mineral supplements. There was no statistically significant difference in vitamin and mineral supplement use between genders ($p > 0.05$) (Table 4.5.).

Table 4.6. Findings Regarding The Water Consumption and Sleep Duration According To Gender

	Gender	**n**	**Mean**	**t**	**p**
Daily Water Consumption (liter)	Women	290	1.71 ± 0.89	-7.116	0.000*
	Men	107	2.62 ± 1.20		
	Total	397	1.96 ± 1.06		
Daily Sleep Duration (hour)	Women	290	6,96 ± 1.16	-0.634	0.527
	Men	107	7,05 ± 1.20		
	Total	397	6.99 ± 1.17		

***p<0.05 **p < 0.01**

In Table 4.6, students were asked about the amount of water they consumed daily and their sleep duration. The average daily water consumption of women was found to be 1.71±0.89 liters, the average daily water consumption of men was 2.62±1.20 liters, and the total daily average water consumption of students was 1.96±1.06 liters. There was a statistically significant difference in daily average water consumption between genders ($p < 0.000$).

The average daily sleep duration was found to be 6.96±1.16 hours in women, 7.05±1.20 hours in men, and 6.99±1.17 hours in total. It was found that sleep durations did not show any statistical difference between genders ($p > 0.05$).

Table 4.7. Distribution of Meals Have Eaten Out According to Gender

	n (%)		
How often do you eat out?	**Women**	**Men**	**Total**
None/once a month	29(10.0)	13(12.1)	42(10.6)
1-3 times a month	41(14.1)	13(12.1)	54(13.6)
Once a week	53(18.3)	23(21.5)	76(19.1)
2-4 times a week	115(39.7)	28(26.2)	143(36.0)
5-6 times a week	29(10.0)	14(13.1)	43(10.8)
Once a week	10(3.4)	7(6.5)	17(4.3)
2-3 times a day	11(3.8)	9(8.4)	20(5.0)
4-5 times a day	1(0.3)	0(0.0)	1(0.25)
6> times a day	1(0.3)	0(0.0)	1(0.25)

In Table 4.7, students were asked how often they eat out. 10% of the students answered never/once a month, 13.6% of the students answered 1-3 times a month, 19.1% of the students answered once a week, 36% of the students answered 2-4 times a week, 10.8% of the students answered 5-6 times a week, 4.3% of the students answered

once a day, 5% of the students answered eat out 2-3 times a day, 0.25% of the students answered eat out 4-5 times a day, and 0.25% of the students answered eat out more than 6 times a day.

When the frequency of students eating out was evaluated, a statistical difference based on gender was found to be significant only in favor of women who consumed 2-3 meals out a day ($p = 0.009$). There was no statistically significant difference between genders on other frequencies of meals consumed out ($p > 0.05$).

Table 4.8. Distribution of Dietary Fiber Knowledge Questionnaire Answers by Gender

		Responses			
Questions	**Gender**	**True**	**False**	**Not Sure**	**p**
Part A: Dietary Fiber and Health		**n(%)**	**n(%)**	**n(%)**	
A1, Dietary fiber is a carbohydrate found in foods	Women	112(38.6)	48(16.6)	130(44.6)	
	Men	39(36.4)	13(12.1)	55(51.4)	0.693
	Total	151(38.0)	61(15.4)	185(46.6)	
A2, Dietary fiber has a high energy content.	Women	138(47.6)	47(16.2)	105(36.2)	
	Men	39(36,4)	25(23.4)	43(40.2)	0.125
	Total	177(44.6)	72(18.1)	148(37.3)	
A3, Regular consumption of dietary fiber may prevent colon cancer	Women	140(48.3)	9(3.1)	141(48.6)	
	Men	48(44.9)	2(1.9)	57(53.3)	0.546
	Total	188(47.4)	11(2.4)	198(49.9)	
A4, Dietary fiber can help maintain our body weight	Women	205(70.7)	1(0.3)	84(29.0)	
	Men	61(57.0)	54.7)	41(38.3)	0.014*
	Total	266(67.0)	6(1.5)	125(31.5)	
A5, Foods that contain dietary fiber should not be consumed by people who have diabetes	Women	29(10.0)	93(32.1)	168(57.9)	
	Men	7(6.5)	39(36.4)	61(57.0)	0.412
	Total	36(9.1)	132(33.2)	229(57.7)	
A6, Regular consumption of dietary fiber may reduce blood cholesterol levels	Women	128(44.1)	9(3.1)	153(52.8)	
	Men	41(38.3)	7(6.5)	59(55.1)	0.296
	Total	169(42.6)	16(4.0)	212(53.4)	
A7, When the consumption of dietary fiber increases, bowel movements will slow down	Women	30(10.3)	168(57.9)	92(31.7)	
	Men	10(9.3)	45(42.1)	52(48.6)	0.005*
	Total	40(10.1)	213(53.7)	144(36.3)	
A8, It is not necessary to consume foods that contain dietary fiber on a daily basis	Women	29(10.0)	153(52.8)	108(37.2)	
	Men	9(8.4)	50(46.7)	48(44.9)	0.287
	Total	38(9.6)	203(51.1)	156(39.3)	
A9, Excessive consumption of dietary fiber may interfere with	Women	95(32.8)	47(16.2)	148(51.0)	0.092
	Men	26(24.3)	11(10.3)	70(65.4)	

vitamin and mineral absorption	Total	121(30.5)	58(14.6)	218(54.9)	
Part B: Dietary Fiber and Foods					
B1, White bread has the highest dietary fiber content compared to other types of breads	Women	24(8.3)	148(51.0)	118(40.7)	0.155
	Men	12(11.2)	46(43.0)	49(45.8)	
	Total	36(9.1)	194(48.9)	167(42.1)	
B2, Raw vegetables have a higher dietary fiber content compared to cooked ones	Women	193(66.6)	11(3.8)	86(29.7)	0.000*
	Men	48(44.9)	5(4.7)	54(50.5)	
	Total	241(60.7)	16(4.0)	140(35.3)	
B3, 100 g of fruit, and 100 g of fruit juice both contain the same amounts of dietary fiber	Women	4(1.4)	205(70.7)	81(27.9)	0.514
	Men	2(1.9)	72(67.3)	33(30.8)	
	Total	6(1.5)	277(69.8)	114(28.7)	
B4, Milk and milk products do not contain dietary fiber	Women	69(23.8)	47(16.2)	174(60.0)	0.767
	Men	27(25.2)	16(15.0)	64(59.8)	
	Total	96(24.2)	63(15.9)	238(59.9)	
B5, Legumes (such as beans, chickpeas, etc.) have the highest dietary fiber content	Women	167(57.6)	17(5.9)	106(36.6)	0.351
	Men	56(52.3)	5(4.7)	46(43.0)	
	Total	223(56.2)	22(5.5)	152(38.3)	
B6, Dietary fiber intake can be increased by consuming more foods in the meat group (meat, poultry, and fish)	Women	75(25.9)	72(24.8)	143(49.3)	0.764
	Men	26(24.3)	25(23.4)	56(52.3)	
	Total	101(25.4)	97(24.4)	199(50.1)	
B7, Nuts, such as hazelnuts and almonds, are rich in dietary fiber	Women	173(59.7)	15(5.2)	102(35.2)	0.008*
	Men	48(44.9)	9(8.4)	50(46.7)	
	Total	221(55.7)	24(6.0)	152(38.3)	
B8, Fruits with skin contain more dietary fiber than the ones without skin	Women	115(39.7)	20(6.9)	155(53.4)	0.027*
	Men	30(28.0)	2(1.9)	75(70.1)	
	Total	145(36.5)	22(5.5)	230(57.9)	
B9, Fast food consumption, in general, contributes to our dietary fiber intake	Women	9(3.1)	203(70.0)	78(26.9)	0.128
	Men	2(1.9)	66(61.7)	39(36.4)	
	Total	11(2.8)	269(67.8)	117(29.5)	

***p<0.05 **p < 0.01**

Table 4.8 shows students' answers to questions regarding their knowledge of dietary fiber.

When students' dietary fiber knowledge levels were compared between men and women,

In part A, fiber and health, in the first question, 38% knew that dietary fiber is carbohydrate, while 46.6% marked "not sure." There was no statistically significant difference between the correct answers between men and women ($p > 0.05$).

The second question asked about the energy content of dietary fiber, and the lowest correct answer rate was given both in this part and the entire survey, with 18.1%. 44.6% answered incorrectly, and 37.3% marked "not sure." There was no statistically significant difference between the correct answers between men and women ($p > 0.05$).

In the 3rd question, 47.4% of the students answered correctly that regular consumption of dietary fiber prevents colon cancer. There was no statistically significant difference between the correct answers between men and women ($p > 0.05$).

In the 4th question, 67% answered correctly that dietary fiber helps maintain body weight, which is the highest correct answer for this part and the 2nd highest in the entire survey. A statistically significant difference was found between the correct answers between men and women ($p = 0.014$).

In the 5th question, 9.1% of the students answered incorrectly and marked that individuals with diabetes should not consume dietary fiber. 33.2% answered correctly, while 57.7% marked "not sure." There was no statistically significant difference between the correct answers between men and women ($p > 0.05$).

In question 6, 46.7% of the students knew that dietary fiber has a cholesterol-lowering effect, and only 4% answered incorrectly. 53.4% marked "not sure". There was no statistically significant difference between the correct answers between men and women ($p > 0.05$).

In the 7th question, more than half of the students (53.7%) correctly answered that increasing dietary fiber consumption will not slow down bowel movements. A statistically significant difference was found between the correct answers between men and women ($p = 0.005$).

In the 8th question, 51.1% of the students knew correctly that dietary fiber should be consumed daily. 39.9% marked "not sure". There was no statistically significant difference between the correct answers between men and women ($p > 0.05$).

In the last question of this part, 30.5% of the students knew that excessive consumption of dietary fiber would negatively affect vitamin and mineral absorption, while 54.9% marked "not sure." There was no statistically significant difference between the correct answers between men and women ($p > 0.05$).

In Part B, dietary fiber and foods, 48.9% of the students answered correctly that white bread contains less dietary fiber than other bread kinds by marking "wrong" in the first question. There was no statistically significant difference between the correct answers between men and women ($p > 0.05$).

In the second question, when asked about the dietary fiber content comparison of raw and cooked vegetables, it was observed that 60.7% of the students knew that raw vegetables contain higher dietary fiber. A statistically significant difference was found between the correct answers between men and women ($p < 0.001$)

In the third question, when asked about the dietary fiber contents of equal weights of the fruit itself and its juice, it was observed that 69.7% of the students gave the highest correct answer in this part and the whole study and knew that the same amount of fruit itself contains more dietary fiber than its juice. There was no statistically significant difference between the correct answers between men and women ($p > 0.05$).

In the 4th question, 24.2% of the students knew that milk and dairy products do not contain dietary fiber, while in the 5th question, 56.2% of the students knew that legumes have the highest dietary fiber content. There was no statistically significant difference between the correct answers between men and women ($p > 0.05$).

In the 6th question, 24.4% and 67.7% of the students knew that consuming meat group foods, and in the 9th question, consuming fast food would not increase dietary fiber intake, respectively, and 50.1% and 29.5% respectively marked "not sure." There was no statistically significant difference between the correct answers between men and women ($p > 0.05$).

In the 7th question, 55.7% and 36.5% of the students, respectively, correctly answered that nuts contain a high amount of dietary fiber, and in the 8th question, that fruits with shells contain more dietary fiber than those without skin. A statistically significant difference was found between the correct answers between men and women ($p<0.05$).

Table 4.9. Results of Dietary Fiber Knowledge Questionnaire by Gender

	Gender	n	Mean	Min.	Max.	p
Part A (Dietary Fiber and Health)	Women	290	3.9 ± 2.5	0	9	0.121
	Men	107	3.5 ± 2.5	0	8	
	Total	397	3.8 ± 2.5	0	9	
Part B (Dietary Fiber and Foods)	Women	290	4.6 ± 2.5	0	9	0.011*
	Men	107	3.9 ± 2.7	0	8	
	Total	397	4.4 ± 2.6	0	9	
Total	Women	290	8.6 ± 4.4	0	17	0.031*
	Men	107	7.4 ± 4.9	0	15	
	Total	397	8.3 ± 4.55	0	17	

***p<0.05; **p < 0.01**

The scores of Part A and Part B and the total score of the students' dietary fiber knowledge survey scores were evaluated according to gender and total, as shown in Table 4.9. The survey was evaluated out of 18, with the lowest score being 0 and the highest score being 17 in this study. The average score was 8.6 ± 4.4 for women, 7.4 ± 4.9 for men, and 8.3 ± 4.5 in total. For Part A, the average score was 3.8 ± 2.5, and for Part B, the average score was 4.4 ± 2.6. A statistically significant difference was found between the total scores ($p = 0.031$) and the scores of Part B ($p = 0.011$) between genders.

Table 4.10. Results of the SF-36 Health Survey Scores by Gender

	Gender	n	Mean	p
Total Score	Women	290	78.26 ± 11.56	
	Men	107	81.70 ± 10.21	0.007*
	Total	397	79.18 ± 11.30	
Physical Functioning Score	Women	290	89.62 ± 11.80	
	Men	107	92.38 ± 16.67	0.000*
	Total	397	90.37 ± 13.33	
Role Limitations Due to Physical Health Score	Women	290	66,03 ± 34.88	
	Men	107	70.09 ± 31.74	0.293
	Total	397	67.13 ± 34.07	
Role Limitations Due to Emotional Problems Score	Women	290	44.48 ± 23.57	
	Men	107	49.22 ± 22.59	0.073
	Total	397	45.76 ± 23.38	
Energy/Fatigue Score	Women	290	83.00 ± 15.97	
	Men	107	85.00 ± 13.68	0.366
	Total	397	83.54 ± 15.40	
Emotional Well-Being Score	Women	290	84.68 ± 15.26	
	Men	107	86.88 ± 12.73	0.429
	Total	397	85.27 ± 14.64	
Social Functioning Score	Women	290	80.43 ± 18.82	
	Men	107	84.70 ± 16.14	0.038*
	Total	397	81.58 ± 18.22	
Pain Score	Women	290	71.03 ± 21.75	
	Men	107	77.64 ± 18.40	0.003*
	Total	397	72.81 ± 21.08	
General Health Score	Women	290	81.90 ± 17.61	
	Men	107	86.52 ± 16.74	0.000*
	Total	397	83.14 ± 17.48	

***p<0.05; **p < 0.01**

In Table 4.10, students' SF-36 Health Survey scores were evaluated according to gender in 9 categories, including the total score. The entire survey was assessed out of

100, and the total score was 79.18 ± 11.30, 78.26 ± 11.56 for women, and 81.70 ± 10.21 for men. The total score was found to be the 2nd highest score of all 9 categories. A statistically significant difference was found between genders ($p = 0.007$).

When physical functioning results were evaluated, it was found to be 90.37 ± 13.33 in total, 89.62 ± 11.80 in women, and 92.38 ± 16.67 in men. A statistically significant difference was found between genders **(**$p < 0.001$).

When the categories of role limitations due to physical health, role limitations due to emotional problems, energy/fatigue, and emotional well-being were evaluated, the total scores were found to be 67.13 ± 34.07, 45.76 ± 23.38, 83.54 ± 15.40, and 85.27 ± 14.64, respectively. Role limitations due to the physical health category were found to be the lowest-scored category of all 9 categories. There was no statistically significant difference between the scores between genders ($p > 0.05$).

When the pain category was evaluated, the total scores were found to be 72.81 ± 21.08, respectively. A statistically significant difference was found between genders ($p = 0.003$).

When the general health category was evaluated, the total scores were found to be 83.14 ± 17.48, respectively. A statistically significant difference was found between genders ($p < 0.001$).

Table 4.11. Distribution of Average Dietary Intake by Gender

Intake of Energy and Dietary Components	Gender	Mean
Total Energy (kcal)	Women	1620.1 ± 410.7
	Men	1934.7 ± 536.4
	Total	1704.9 ± 444.6
Carbohydrate (g)	Women	165.2 ± 25.9
	Men	204.5 ± 34.4
	Total	175.8 ± 28.2
Dietary Fiber (g)	Women	14.42 ± 5.61
	Men	15.54 ± 6.35
	Total	14.72 ± 5.83
Fat (g)	Women	75.7 ± 16.4
	Men	86.4 ± 19.7
	Total	78.6 ± 17.3
Protein (g)	Women	57.3 ± 12.6
	Men	79.8 ± 24.7
	Total	63.4 ± 15.9

In Table 4.11, students' total energy intake, carbohydrate, total dietary fiber, fat, and protein amounts are given according to gender and in total.

The average total energy intake was found to be 1620.1 ± 410.7 kcal for women, 1934.7 ± 536.4 kcal for men, and 1704.9 ± 444.6 kcal in total. Carbohydrate intake was 165.2 ± 25.9 g for women, 204.5 ± 34.4 g for men, and 175.8 ± 28.2 g in total. Total fat intake was 78.6 ± 17.3 g, and total protein intake was 63.4 ± 15.9 g.

Table 4.12. Distribution of Average Dietary Fiber Intake by Gender

	Gender	n	Mean	t	p
Total dietary fiber (g)	Women	290	14.42 ± 5.61		
	Men	107	15.54 ± 6.35	-1.696	0.091
	Total	397	14.72 ± 5.83		
Soluble dietary fiber (g)	Women	290	3.66 ± 2.61		
	Men	107	4.08 ± 3.02	-1.341	0.181
	Total	397	3.78 ± 2.23		
Insoluble dietary fiber (g)	Women	290	10.77 ± 3.41		
	Men	107	11.45 ± 3.74	-1.704	0.089
	Total	397	10.96 ± 3.51		

***p<0.05; **p < 0.01**

In Table 4.12, students' total dietary fiber, soluble dietary fiber, and insoluble dietary fiber intake amounts are given according to gender and in total. The average daily dietary fiber intake of the students was found to be 14.72 ± 5.83 grams. The amounts in women and men were found to be 14.42 ± 5.61 grams and 15.54 ± 6.35 grams, respectively. There was no statistically significant difference between the amounts between genders ($p > 0.05$).

When students' daily soluble dietary fiber and insoluble dietary fiber intakes were evaluated, they were found to be 3.78 ± 2.23 grams and 10.96 ± 3.51 grams, respectively. There was no statistically significant difference between the amounts between genders ($p > 0.05$).

Table 4.13. Measurement of Adequacy of Average Dietary Fiber Intakes by Gender

	Gender			
Dietary Fiber Levels	**Women** n (%)	**Men** n (%)	**Total** n (%)	**p**
Insufficient (<25 g)	269 (92.8)	93 (86.9)	362 (91.2)	0.069
Sufficient (≥25 g)	21 (7.2)	14 (13.1)	35 (8.8)	
Total	290 (73)	107 (27)	397	

***p<0.05; **p < 0.01**

In Table 4.13, students' daily dietary fiber intake by gender and in total is evaluated in two categories: sufficient (≥ 25 g) and insufficient (< 25 g). It was observed that 92.8% of women, 86.9% of men, and, in total, 91.2% consumed insufficient dietary fiber, and 7.2% of women, 13.1% of men, and in total, 8.8% of students consumed sufficient amounts of dietary fiber. There was no statistically significant difference between the amounts between genders ($p > 0.05$).

Table 4.14. Comparison of BMI with Dietary Fiber Adequacy Levels

	BMI				
Dietary Fiber Levels	**Underweight (<18.5 kg/m^2)**	**Normal Weight (18.5-24.9 kg/m^2)**	**Overweight (25.0-29.9 kg/m^2)**	**Obese (≥30 kg/m^2)**	**p**
Insufficient (<25 g)	45 (97.8)	230 (89.1)	68 (93.2)	19 (95.0)	
Sufficient (≥25 g)	1 (2.2)	28 (10.9)	5 (6.8)	1 (5.0)	0.906
Total	46	258	73	20	

***p<0.05; **p < 0.01**

In Table 4.14, students' BMI and dietary fiber sufficiency levels were compared. 97.8% of underweight students, 89.1% of normal-weight students, 93.2% of overweight students, and 95% of obese students consumed insufficient amounts of dietary fiber. There was no statistically significant difference between BMI and dietary fiber sufficiency ($p > 0.05$).

Table 4.15. Comparison of Total Dietary Fiber Intake with Dietary Fiber Knowledge Questionnaire Scores

		Dietary Fiber Intake (g)
Total Dietary Fiber Knowledge Score	r	0.492**
	p	0.000*
Part A: Dietary Fiber and Health Scores	r	0.475**
	p	0.000*
Part B: Dietary Fiber and Foods Scores	r	0.411**
	p	0.000*

***p<0.05; **p < 0.01**

In Table 4.15, students' dietary fiber intake amounts were compared with their dietary fiber knowledge survey scores. A moderately positive ($r = 0.492$) and significant ($p < 0.001$) difference was found between total dietary fiber knowledge survey scores and dietary fiber intake amounts.

When the first part of the dietary fiber knowledge survey scores, Part A, dietary fiber and health, was compared with the students' dietary fiber intake, a moderately positive ($r = 0.475$) and significant ($p < 0.001$) relationship was found.

When the second part of the dietary fiber knowledge survey, Part B, dietary fiber and foods, was compared with the students' dietary fiber intake, a moderately positive ($r = 0.411$**)** and significant ($p < 0.001$) relationship was found.

Table 4.16. Comparison of Dietary Fiber Intake with the SF-36 Health Survey Scores

SF-36 Health Survey Scores		Dietary Fiber Intake (g)
Total Score	r	0.122**
	p	0.015*
Physical Functioning Score	r	0.140**
	p	0.005*
Role limitations Due to Physical Health	r	0.047
Score	p	0.350
Role Limitations Due to Emotional	r	0.024
Problems Score	p	0.628
General Health Score	r	0.074
	p	0.141
Emotional well-being score	r	0.062
	p	0.221
Social Functioning Score	r	0.083
	p	0.098
Pain Score	r	0.033
	p	0.507
Energy/Fatigue Score	r	0.071
	p	0.161

***p<0.05; **p < 0.01**

In Table 4.16, the students' SF-36 survey scores consisting of 9 categories are compared with their dietary fiber intake.

When the total score of the students' SF-36 health survey was compared with the amount of dietary fiber intake, a very weak positive (r = 0.122) and significant (p = 0.015) relationship was found.

A very weak positive (r = 0.140) and significant (p = 0.005) relationship was found when students' physical functioning scores were compared with their dietary fiber intake.

No statistically significant relationship was found between students other than the SF-36 Health Survey category scores and dietary fiber intake ($p > 0.05$).

Table 4.17. Comparison of Dietary Fiber Knowledge Scores with SF-36 Health Survey Scores

SF-36 Health Survey Scores		Total Dietary Fiber Knowledge	Part A: Dietary Fiber and Health	Part B: Dietary Fiber and Foods
Total Score	r	0.043	0.002	0.074
	p	0.396	0.966	0.141
Physical Functioning Score	r	0.098	0.078	0.101**
	p	0.052	0.120	0.045*
Role Limitations Due to Physical Health Score	r	-0.017	-0.049	0.017
	p	0.729	0.332	0.740
Role Limitations Due to Emotional Problems Score	r	0.069	-0.062	-0.062
	p	0.171	0.221	0.216
General Health Score	r	-0.015	-0.015	-0.017
	p	0.760	0.770	0.737
Emotional Well-Being Score	r	-0.006	-0.042	0.032
	p	0.910	0.409	0.525
Social Functioning Score	r	-0.031	-0.054	-0.002
	p	0.537	0.279	0.966
Pain Score	r	0.037	0.000	0.065
	p	0.468	0.993	0.193
Energy/Fatigue Score	r	0.019	0.003	0.027
	p	0.704	0.950	0.594

***p<0.05; **p < 0.01**

In Table 4.17, the students' SF-36 Health Survey scores under 9 categories were compared with the dietary fiber knowledge survey under 3 groups: total score, scores of Part A, and scores of Part B.

There was no statistically significant relationship between the 8 categories of the SF-36 Health Survey and the 3 groups of the dietary fiber knowledge survey ($p > 0.05$).

The category of physical functioning scores and scores of Part B of the dietary fiber knowledge survey had a very weak positive ($p = 0.101$) and significant ($p = 0.045$) relationship.

Table 4.18. Comparison of Dietary Fiber Intake, Dietary Fiber Knowledge Score, and the Total Score SF-36 Health Survey with Meal Count

		Meal Count
Total Dietary Fiber Intake (g)	r	0.215**
	p	0.000*
Total Dietary Fiber Knowledge Survey Score	r	0.049
	p	0.332
Total Score of the SF-36 Health Survey	r	-0.008
	p	0.873

***p<0.05; **p < 0.01**

In Table 4.18, the students' dietary fiber intake, dietary fiber knowledge survey scores, total score of the SF-36 Health Survey, and their meal counts were compared.

A statistically weak positive ($r = 0.215$) and significant ($p < 0.001$) relationship was found between the students' total dietary fiber intake and their meal counts.

There was no significant relationship between meal count and students' total dietary fiber knowledge survey scores and the total SF-36 Health Survey scores ($p > 0.05$).

Table 4.19. Comparison of Dietary Fiber Knowledge, Total Score of the SF-36 Health Survey, Dietary Fiber Intake with Age

		Age
Dietary Fiber Knowledge Scores	r	-0.040
	p	0.424
Total Score of SF-36 Health Survey	r	0.031
	p	0.535
Dietary Fiber Intake (g)	r	0.036
	p	0.469

***p<0.05; **p < 0.01**

In Table 4.19, the age of the students and their dietary fiber knowledge scores, total self-reported health survey score, and total dietary fiber amount were compared.

There was no statistical relationship between students' age and dietary fiber knowledge scores, total self-reported health survey scores, and total dietary fiber intake ($p>0.05$).

5. DISCUSSION

Individuals with a greater understanding of food components like dietary fiber could be more capable of making educated choices regarding their fiber intake (167). This study investigated and compared university students' dietary fiber intake, dietary fiber knowledge, and self-reported health status.

Studies of university students and adults on nutritional knowledge regarding dietary components, including dietary fiber, were widely studied. In a study conducted with individuals from 10 countries, including Turkey, it was observed that their dietary fiber knowledge was average but at a low level compared to the general population, but the highest levels were seen in the Turkish sample (171). In another study conducted on dietary fiber awareness in the Saudi Arabian population, it was found that individuals had a proper level of knowledge about the benefits of dietary fiber, and the majority had a high level of knowledge on dietary fiber and metabolic diseases (183).

In this study, dietary fiber knowledge questionnaire scores were 8.6 ± 4.4 for women, 7.4 ± 4.9 for men, and 8.3 ± 4.55 in total. The lowest score is 0, and the highest is 17 out of 18 questions. For Part A (dietary fiber and health) of the survey, the average score was 3.8 ± 2.5; for Part B (dietary fiber and foods), the average score was 4.4 ± 2.6. Similarly, in the study of the validity and reliability of the dietary fiber knowledge survey, conducted by Deniz and Alsaffar (2013) with 360 students, students who did not take any nutritional course (n = 186) scored 7.5 ± 4.5 in total, 3.5 ± 2.4 for Part A, and 4.0 ± 2.5 for Part B on average (28).

In the questions about the sources of dietary fiber (Part B; 4-7), Deniz and Alsaffar (2013) stated that students had insufficient knowledge about the sources of dietary fiber. In this study, the students answered these questions correctly with 24.4%, 56.2%, 24.4%, and 55.7%, respectively. When compared, the answers to the 4th and 6th questions in this study were lower than the results of Deniz and Alsaffar (2013), and the answers to the 5th and 7th questions were found to be higher (28).

A recent study in Turkey by Saglam et al. (2023) was conducted to investigate whether adolescent students' dietary fiber knowledge levels affect their dietary fiber intake. When the dietary fiber knowledge level scores were evaluated out of 100, Saglam et al. (2023) found the total score to be 52.2 ± 12.3, while it was 41.0 ± 16.1 in

the dietary fiber sources section and 63.5 ± 18.1 in the section on the relationship of dietary fiber with health (195). Supporting this, in another study conducted by Szűcs et al. (2017), the dietary fiber knowledge of individuals participating from Portugal, Argentina, and Slovakia was measured, and their knowledge of dietary fiber on health was found to be higher than their knowledge of dietary fiber sources (196). On the contrary, in this study, the dietary fiber and foods section received a higher score than the dietary fiber and health section.

Similar to Deniz and Alsaffar (2013), our study included university students and obtained identical results regarding the total score, dietary fiber and health (Part A), and dietary fiber and foods (Part B) (28). In contrast, adolescent students achieved a higher total score in the study conducted by Sağlam et al. (2023) compared to this study's total score, where the high school was the lowest education level (195). However, it should be taken into consideration that different scales were used in measuring dietary fiber knowledge level in this study than by Saglam et al. (2023), and the same scale was used by Deniz and Alsaffar (2013) (28,195).

According to TUBER, in Turkey, it is recommended for adults to consume 25 g of dietary fiber daily, and similarly, according to the European Food Safety Authority (EFSA), adults are advised to consume at least 25 g of dietary fiber daily (23,100). TBSA's 2017 data showed that 32.8% of individuals in Turkey reached the recommended amount (10). In this study, only 8.8% of the students reached the dietary fiber target of 25 g/day, and the mean dietary fiber intake was found to be 14.72 ± 5.83 g/day. Similarly, Mei et al. (2021) conducted a study with university students and found that mean dietary fiber intake was 17.72 g/day (197).

Similar to these results, many studies have observed that individuals do not consume the daily recommended amount of dietary fiber (196,198-200). A study conducted with university students found that the mean dietary intake was 15.36 ± 7.96 g/day. Still, in contrast, they found that the women group particularly had higher daily dietary fiber intake than men. In contrast, there was no significant difference in daily dietary fiber intake regarding gender in this study (201).

Another study aiming to assess university students' dietary fiber intake and their defecation frequency was conducted in 2023 in Turkey. Similar to our study, the daily dietary fiber intake was found to be 14.7 ± 5.5 g and 14.0 ± 6.2 g in women and men,

respectively, and there was no significant difference between genders regarding their dietary fiber intake. They stated in the study that dietary fiber intake was lower than the recommended amount for Turkey, and education in this specific field should be given to the students to increase their daily dietary fiber intake (202).

A study aiming to assess dietary fiber intake and its relation to dietary fiber awareness and knowledge found that higher dietary fiber consumption is related to a lower obesity rate (183). Unlike these findings, this study found no statistically significant difference between BMI and dietary fiber intake.

The dietary habits of university students are influenced mainly by the food environments on campuses at universities (175). A few studies have shown that students who eat one meal per day tend to skip meals and pay barely any consideration to their meal components (173,174). In this study, on the contrary, only 1.5% of the students eat only one meal a day. 37.0% consume 2 meals a day, and 48.1% consume 3 meals a day.

Dietary fiber has been shown to have numerous advantages in research (103-105). Dietary fiber lowers the chance of getting diseases like obesity, cancer, T2DM, hypertension, coronary heart disease, and stroke, but university students do not feel at risk because their young age is considered healthy and the risk of NCDs is low (13,31,39,69).

In this study, students answered the SF-36 health survey, in which they evaluated their own health in 8 sections. In a study conducted in Turkey, the health status of individuals was analyzed with the SF-36 survey, and when compared to this study, health scores were found to be higher in the 6 groups, except for the physical functionality and role limitations due to emotional problems groups (203).

When the results of men and women were compared in the same study, it was observed that men received higher scores than women in all sections. Similarly, in this study, although men scored higher than women in all sections, a significant relationship was found between men and women in the physical functioning, social functioning, pain, and general health scores (203).

There are studies investigating dietary fiber and health, but no study in the literature directly compares dietary fiber intake with individuals' self-reported health status by the SF-36 Health Survey. In this study, as a result of the comparison of dietary

fiber intake and the SF-36 health survey, a very weak but significant relationship was observed between the total score of the SF-36 Health Survey, physical functioning scores, and dietary fiber intake, and also a very weak but significant relationship was observed between physical functioning scores and Part B of the dietary fiber knowledge scores.

6. CONCLUSION

In this study, it was observed that university students did not consume enough daily dietary fiber. Although there was no significant difference, men were found to be consuming slightly more dietary fiber than women. Knowledge levels of dietary fiber in total, the effect of dietary fiber on health, and the sources of dietary fiber were found to be answered correctly below 50%. A higher total score was seen in women in every group.

However, it was found that dietary fiber knowledge levels had a positive, moderate relationship with dietary fiber intake, and it was observed that dietary fiber intake was not affected by BMI or gender. A very weak but significant result was found between dietary fiber intake and total health status outcome. However, no significance was found in the other 7 parts of the health status survey, which consisted of 8 categories; no significant relationship was found between dietary fiber knowledge levels and health status.

The reasons behind the below-recommended daily dietary fiber consumption of university students are unclear. Many studies were conducted to examine dietary fiber intake and factors influencing dietary intake of dietary components, including dietary fiber, and found that people mostly do not meet the recommended amount of dietary fiber, similar to this study. Although dietary fiber knowledge level is a factor affecting the consumption of dietary fiber, other environmental factors should be considered, such as socioeconomic and educational levels.

Since this study only collects data at one point in time, it may not be able to account for temporal variations in variables of interest or reflect changes over time. Furthermore, because the group was chosen from just one university, the results might not fairly represent the overall population. Additionally, depending on participants' comprehension and willingness to divulge information, the use of self-reported data may bring errors and discrepancies.

The positive effects of dietary fiber on health have been proven in many studies, and it is known that inadequate intake can increase the risk of developing NCDs. Studies show that in Turkey and other countries, university students' dietary fiber intake is lower than the recommended amount, and it is believed that the reason behind this

inadequacy is their food choices, especially consuming mostly fast foods, which are low in dietary fiber. In this study, it has been statistically shown that the amount of dietary fiber intake is affected by the level of knowledge, and although their general health status is found to be suitable by the SF-36 Health Survey, probably due to their young age, it is recommended that studies be carried out to improve the level of dietary fiber knowledge of the whole population, especially the young population, and to prevent diseases that may develop due to dietary fiber in the future.

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8. APPENDIX

8.1. ETHICAL APPROVAL

T.C.
YEDİTEPE ÜNİVERSİTESİ REKTÖRLÜĞÜ
Girişimsel Olmayan Klinik Araştırmalar Etik Kurulu

Sayı : E.83321821-805.02.03-324
Konu : Etik Kurul Karar Yazısı

Sayın Dr. Öğr. Üyesi Gözde DUMLU BİLGİN

Yeditepe Üniversitesi Girişimsel Olmayan Klinik Araştırmalar Etik Kuruluna etik onay için başvuru yapılmış olan araştırma önerisinin başlığı, araştırmacılar, başvuru numarası, sunulan belgeler ve toplantı bilgileri aşağıda yer almaktadır. İlgili araştırma önerisi, etik kurulumuz üyeleri tarafından değerlendirilmiş olup, etik ve bilimsel açıdan **UYGUN** olduğuna karar verilmiştir.

Araştırma Başlığı:	İstanbul'da Bir Vakıf Üniversitesindeki Öğrencilerin Diyet Lifi Alım Miktarları ve Bilgi Düzeylerinin Kendi Rapor Ettikleri Sağlık Durumları ile İlişkisi
Araştırmacılar:	Yeşim KÖYLÜOĞLU, Dr. Öğr. Üyesi Gözde DUMLU BİLGİN
Başvuru Numarası:	202312Y0522

TOPLANTI BİLGİLERİ			
Toplantı Tarihi:	08.12.2023	**Toplantı Yeri:**	Çevirim içi (Google Meet)

SUNULAN BELGELER
Islak imzalı başvuru dosyası, CD veya USB belleğe kaydedilmiş başvuru dosyası ve elektronik başvuru
Araştırma başlığı ve araştırmacıların isimleri
Başvuru dilekçesi
Başvuru formu
Araştırmanın;
• Niteliği
• Önemi ve özgün değeri
• Amaç ve hedefleri
• Yöntemi
• Yönetimi
• Yaygın etkisi
• Araştırma bütçesi (Mevcutsa)
• Süresi ve uygunluğu (Zaman cetveli)
• Kaynakları
Bilgilendirilmiş Gönüllü Olur Formu (yapılan araştırmaya özel olarak hazırlanmış)

Bu belge, güvenli elektronik imza ile imzalanmıştır.
Belge Doğrulama Adresi : http://belgedogrulama.yeditepe.edu.tr/bg.aspx?id=5BBE1C4F-E6B7-4150-9DD3-A6348C4432D5

Yeditepe Üniversitesi 26 Ağustos Yerleşimi, İnönü Mahallesi Kayışdağı Caddesi 34755
Ataşehir / İSTANBUL
Telefon No: (0216) 578 00 00 Faks No : (0216) 578 02 99
İnternet Adresi www.yeditepe.edu.tr
Kep Adresi : yeditepeuniversitesi@hs03.kep.tr

Bilgi İçin: Sevgi BAYRAKTAR
Unvan: Uzman Yardımcısı
Telefon No: (0216) 578 00 00 / 6347

Taahhütname-1 Araştırmanın yapılacağı kurumdan izin alma sorumluluğunun araştırmacılara ait olduğuna dair taahhüt
Taahhütname-2 Dünya Tıp Birliği Helsinki Bildirgesinin son versiyonunun ve Sağlık Bakanlığı'nın ilgili tüm kılavuzlarının okunmasına dair taahhüt
Taahhütname-3 Daha önce yapılmış etik kurul başvuruları mevcut olup olmadığına dair taahhüt
Taahhütname-4 Araştırma sırasında araştırma bütçesinde yer almayan ve gönüllünün kendisine veya Sosyal Güvenlik Kurumuna ek yük getirecek hiçbir işlem uygulanmayacağına dair taahhüt
Taahhütname-5 COVID-19 hastalarında tedavi yaklaşımları ve bilimsel araştırmalar genelgesi okunmasına dair taahhüt
Taahhütname-6 Millî Eğitim Bakanlığı Araştırma Uygulama İzinleri konulu yazının okunmasına dair taahhüt
Araştırmacıların her birisine ait özgeçmiş formu
Ek belgeler (Varsa kullanılan ölçek)

Prof. Dr. Didem ÖZDEMİR ÖZENEN
Başkan

Doç. Dr. Gökhan ERTAŞ
Başkan Yardımcısı

Prof. Dr. Elif SUNGURTEKİN EKÇİ
Raportör

Dr. Öğr. Üyesi Elif Çiğdem KELEŞ
Üye

Dr. Öğr. Üyesi Sevim ŞEN OLGAY
Üye

Yeditepe Üniversitesi 26 Ağustos Yerleşimi, İnönü Mahallesi Kayışdağı Caddesi 34755
Ataşehir / İSTANBUL
Telefon No: (0216) 578 00 00 Faks No : (0216) 578 02 99
İnternet Adresi www.yeditepe.edu.tr
Kep Adresi : yeditepeuniversitesi@hs03.kep.tr

Bilgi İçin: Sevgi BAYRAKTAR
Unvan: Uzman Yardımcısı
Telefon No: (0216) 578 00 00 / 6347

8.2. CONFIRMATION FORM

1996
YEDİTEPE ÜNİVERSİTESİ

İstanbul'da Bir Vakıf Üniversitesindeki Öğrencilerin Diyet Lifi Alım Miktarları ve Bilgi Düzeylerinin Kendi Rapor Ettikleri Sağlık Durumları ile İlişkisi

Bilgilendirilmiş Gönüllü Onam Formu

Şu anda davet edilmiş bulunduğunuz ***"İstanbul'da Bir Vakıf Üniversitesindeki Öğrencilerin Diyet Lifi Alım Miktarları ve Bilgi Düzeylerinin Kendi Rapor Ettikleri Sağlık Durumları ile İlişkisi"*** isimli bu araştırma, Yeditepe Üniversitesi Sağlık Bilimleri Enstitüsü Beslenme ve Diyetetik Anabilim Dalı'nda yüksek lisans tezi kapsamında yapılacak olup minimum 376 lisans öğrencisine ulaşmak hedeflenerek araştırmacı Yeşim Köylüoğlu tarafından yürütülecektir.

Dengeli ve sağlıklı bir diyet, günlük olarak yeterli miktarda diyet lifi alımını önermektedir. Yapılan çalışmalarda diyet lifi alımının kardiyovasküler hastalıklar, tip 2 diyabet ve bazı sindirim sistemi hastalıkların risklerini azalttığı, obezite ve ağırlık kontrolünde olumlu etkiler sağladığı gösterilmektedir. Üniversite öğrencilerinin beslenme alışkanlıkları incelendiğinde ise genellikle diyet lifi yönünden fakir, işlenmiş ve hazır besinlere yönelimin olduğu görülmektedir. Beslenme farkındalığı üzerinde yapılan araştırmalarda, yetişkinlerin diyet lifi farkındalığı ile diyet lifi alımları arasında bir ilişki olabileceği vurgulanmaktadır. Bu araştırma ile sizlerin beslenme örüntülerinde diyet lifine ne kadar yer verdiğinizi tespit edip diyet lifleri hakkındaki bilgi düzeyleriniz ile kendi rapor ettiğiniz sağlık durumunuz ile kıyaslamayı amaçlamaktayız.

Bu çalışmaya katılmak **gönüllülük** esasına dayanmaktadır. Çalışmaya katılmama ve çalışmanın herhangi bir aşamasında hiçbir sebep göstermeden çalışmadan ayrılma hakkına sahipsiniz. Kişisel bilgileriniz tamamen çalışma için toplanılacak olup **gizli** tutulacaktır. Araştırmada yer almanız nedeniyle size hiçbir ödeme yapılmayacak ve

sizden de hiçbir ücret talep edilmeyecektir. Anketi doldurmanız halinde çalışmaya **katılmaya onam verdiğiniz** anlamına gelir. Herhangi bir soru veya detaylı bilgi için araştırmacı **Yeşim KÖYLÜOĞLU'na** e-posta adresinden ulaşabilirsiniz.

Yukarıda verilen ve yapılan tüm açıklamaları okudum/sözlü olarak dinledim. Bana yukarıda konusu ve amacı belirtilen araştırma ile ilgili yazılı ve sözlü açıklama aşağıda belirtilen araştırmacı tarafından yapıldı. Araştırmaya gönüllü olarak katıldığımı istediğim zaman gerekçeli veya gerekçesiz olarak araştırmadan ayrılabileceğimi biliyorum. Araştırma için herhangi bir ödeme almayacağımı veya yapmayacağımı biliyorum. Söz konusu araştırmaya kendi rızamla katılmayı kabul ediyorum. Araştırma hakkındaki yukarıdaki ve istenen diğer bilgiler katılımcıya tarafımdan açıklanmış ve yazılı onamını alınmıştır. Araştırmacının Adı-Soyadı: **Yeşim Köylüoğlu** İmzası: Tarih:

GÖNÜLLÜ **TARİH:** **ADRES:** **TELEFON:** **ADI SOYADI:** **İMZA**	**ARAŞTIRMACI** Dyt. Yeşim KÖYLÜOĞLU **ADRES:** Ataşehir/İSTANBUL	**TANIK** **TARİH:** **ADRES:** **TELEFON:** **ADI SOYADI:** **İMZA**

8.3. SURVEYS

VERİ TOPLAMA FORMU

1) Adı Soyadı:

2) Yaş: **3)** Cinsiyet: **4)** Okuduğu Bölüm:

5) Boy: **6)** Kilo:

7) Medeni Durumunuz

- Evli
- Bekar
- Boşanmış/Dul

8) Eğitim Durumu (Bitirmiş olduğunuz en yüksek eğitim düzeyini seçiniz)

- Lise
- Üniversite
- Yüksek Lisans

10) Tanı konulmuş herhangi bir hastalığınız var mı? Varsa yazınız.

11) Düzenli olarak kullandığınız bir ilaç var mı? Varsa yazınız.

12) Herhangi bir gıda alerjiniz var mı? Varsa yazınız.

13) Düzenli olarak kullandığınız bir besin takviyesi var mı? Varsa yazınız.

14) Sigara ve/veya alkol kullanıyor musunuz?

15) Uyguladığınız özel bir beslenme çeşidi var mı? Varsa belirtiniz.

16) Günde kaç öğün tüketirsiniz?

17) Günlük ortalama kaç saat uyursunuz?

18) Günlük ortalama kaç litre su tüketirsiniz?

24 SAATLİK BESİN TÜKETİM KAYDI

Aşağıdaki tabloyu son 24 saat içerisinde tükettiğiniz besinleri yazarak doldurunuz.

Saat	Besin veya İçecek Adı	Miktar (gram, ml, kaşık vb.)

36 MADDELİ KISA SAĞLIK DURUMU FORMU ANKETİ (SF-36)

Lütfen her soruya tek bir cevap veriniz.

1)Genel sağlık durumunuz hakkında aşağıdaki tanımlardan hangisi doğrudur?

- □ Mükemmel □
- □ Çok iyi □
- □ İyi □
- □ Orta □
- □ Kötü □

2) Bir yıl öncesi ile karşılaştırdığınızda genel sağlık durumunuzu nasıl değerlendirirsiniz?

- □ Bir yıl öncesinden çok daha iyi □
- □ Bir yıl öncesinden biraz iyi □
- □ Hemen hemen aynı □
- □ Bir yıl öncesinden biraz daha kötü □
- □ Bir yıl öncesinden çok daha kötü □

Aşağıdaki sorular bir gün içinde yapabileceğiniz işlerle (aktivitelerle) ilgilidir. Sağlığınız bu aktiviteleri kısıtlıyor mu? Eğer kısıtlıyorsa, ne kadar?

	Evet, Çok kısıtlı	Evet, Biraz Kısıtlı	Hayır, Hiç Kısıtlı Değil
3) Zorlu aktiviteler; örneğin koşma, ağır eşya kaldırma, zor sporlara katılma vb.			
4) Orta derecede aktiviteler; örneğin bir masayı kaldırma, elektrikli süpürgeyi itme hafif sporlara katılma vb.			
5) Ağır kaldırma ve yük taşıma (market poşeti taşıma vb.)□ □ □			
6) Birkaç kat merdiven basamağını çıkma □			
7)Tek bir kat merdiven basamağını çıkma □			
8) Öne eğime, çömelme veya diz çökme □ □			
9) Bir kilometreden fazla yürüme □ □ □			
10) Birkaç yüz metre yürüme □ □ □			
11)100 metre yürüme □ □ □			
12)Kendi başına banyo yapma ve giyinme □ □			

Son 4 hafta içinde çalışma sırasında veya günlük aktiviteleriniz sırasında aşağıdaki problemlerden herhangi birini yaşadınız mı? Her bir soruya evet veya hayır yanıtı verin.

	Evet	Hayır
13)Çalışma yaşamınızda veya diğer aktivitelerinizde geçirdiğiniz zamanı kısalttınız mı?		
14)Arzu ettiğinizden daha az şey mi yaptınız? □ □		
15)Çalışma veya diğer yaptığınız işlerin çeşidinde kısıtlama yaptınız mı? □ □		
16)Çalışma yaşamınızda veya diğer aktivitelerinizi yapmakta güçlük çektiniz mi? (aşırı efor gösterdiniz mi?)		

Son 4 hafta içinde çalışma sırasında veya günlük aktiviteleriniz sırasında duygusal sorunlar nedeniyle (depresyon veya sıkıntı gibi nedenlerle) aşağıdaki problemlerden herhangi birini yaşadınız mı? Her bir soruya evet veya hayır yanıtı verin.

	Evet	Hayır
17)Çalışma yaşamınızda veya diğer aktivitelerinizde geçirdiğiniz zamanı kısalttınız mı?		
18)Arzu ettiğinizden daha az şey mi yaptınız? □ □		
19) Çalışma veya diğer aktivitelerinizi her zamanki gibi dikkatlice yapabildiniz mi? □ □ □		

20) Son 4 hafta içinde fizik sağlığınız veya duygusal sorunlarınız sizin ailenizle, arkadaşlarınızla, komşularınızla olan sosyal ilişkilerinizi ne ölçüde etkiledi?

Lütfen tek bir yanıt veriniz.

- □ Hiç etkilemedi □
- □ Çok az □
- □ Orta derecede □
- □ Epeyce □
- □ Çok fazla □

21) Son 4 hafta içinde ne kadar ağrınız oldu? Lütfen tek bir yanıt veriniz.

- □ Hiç olmadı □
- □ Çok az □
- □ Az □
- □ Orta derecede □
- □ Çok □
- □ Pek çok □

22) Son 4 hafta içinde ağrınız sizin normal çalışmanızı ne kadar etkiledi? (hem ev dışında, hem de ev işi olarak)

- □ Hiç etkilemedi □
- □ Biraz etkiledi □
- □ Orta derecede etkiledi □
- □ Epey etkiledi □
- □ Çok etkiledi □

Aşağıdaki sorular duygularınızı ve son bir ay içinde nasıl olduğunuzu anlamak için düzenlenmiştir. Her bir soru için lütfen size en uygun tek bir yanıtı işaretleyin.

	Sürekli	Çoğu zaman	Epey zaman	Bazen	Ara sıra	Hiç bir zaman
23) Kendinizi yaşam dolu olarak hissettiniz mi?						
24)Çok sinirli biri oldunuz mu?						
25) Hiçbirşeyin size neşelendiremeyeceği kadar moraliniz bozuk ve kötü oldu mu?						
26)Kendinizi sakin ve huzurlu hissettiniz mi?						
27)Çok enerjik oldunuz mu?						
28)Kendinizi kalbi kırık ve üzgün hissettiniz mi?						
29)Kendinizi yıpranmış hissettiniz mi?						
30)Mutlu bir insan oldunuz mu?						
31)Yorgunluk hissettiniz mi?						

32) Son 4 hafta içinde Sağlığınız sosyal aktivitelerinizi sınırladı mı? (arkadaşları veya yakın akrabaları ziyaret etmek gibi)

- □ Hiç etkilemedi □
- □ Biraz etkiledi □
- □ Orta derecede etkiledi □
- □ Epey etkiledi □
- □ Çok etkiledi □

Aşağıdaki cümlelerin sizin için ne kadar doğru veya yanlış olduğunu belirtiniz.

	Kesinlikle doğru	Çoğunlukla doğru	Emin değilim	Çoğunlukla Yanlış	Kesinlikle yanlış
33)Ben diğer insanlara göre daha kolay hastalanıyorum					
34)Tanıdığım kişiler kadar sağlıklıyım □					
35)Sağlığımın kötüleşmekte olduğunu sanıyorum					
36)Sağlığım mükemmel					

□ □□□□

DİYET LİFİ BİLGİ ANKETİ

Madde Numarası	Cevaplar		
	Doğru	Yanlış	Emin Değilim
Bölüm A: Diyet Lifi ve Sağlık			
1 Diyet lifi, gıdalarda bulunan bir karbonhidrattır.			
2 Diyet lifi yüksek enerji içeriğine sahiptir.			
3 Diyet lifinin düzenli tüketimi kolon kanserini önleyebilir.			
4 Diyet lifi vücut ağırlığımızı korumaya yardımcı olabilir.			
5 Diyet lifi içeren besinler diyabetli bireyler tarafından tüketilmemelidir.			
6 Diyet lifinin düzenli tüketimi kan kolesterol seviyelerini düşürebilir.			
7 Diyet lifi tüketiminin artması bağırsak hareketleri yavaşlatır.			
8 Diyet lifi içeren besinlerin günlük olarak tüketilmesi gerekli değildir.			
9 Diyet lifinin aşırı tüketimi, vitamin ve mineral emilimini engelleyebilir.			
Bölüm B: Diyet Lifi ve Besinler			
1 Beyaz ekmek diğer ekmek çeşitleri ile kıyaslandığında en yüksek diyet lifi içeriğine sahiptir.			

2 Çiğ sebzeler pişmiş sebzelere kıyasla daha yüksek lif içeriğine sahiptir.			
3 100 g meyve ile 100 g meyve suyu aynı miktarda diyet lifi içerir.			
4 Süt ve süt ürünleri diyet lifi içermezler.			
5 Baklagiller (fasulye, nohut vb.) en yüksek diyet lifi içeriğine sahiptir.			
6 Et grubundan (et, kümes hayvanları ve balık) daha fazla besin tüketilerek diyet lifi alımı artırılabilir.			
7 Fındık ve badem gibi kuruyemişler diyet lifi açısından zengindir.			
8 Kabuklu meyveler, kabuksuzlara göre daha fazla diyet lifi içerir.			
9 Fast food tüketimi genel olarak diyet lifi alımımıza katkıda bulunur.			

ERİŞKİN SEMİ-KANTİTATİF BESİN TÜKETİM SIKLIĞI ANKETİ

Lütfen her soruyu her satırdaki size uygun kutuya işaret koyarak cevaplayınız.

Geçtiğimiz yıl içinde aşağıda belirtilen hayvansal ürünleri ne sıklıkta tükettiniz?

Süt ve ürünleri	Ortalama miktar*	Hiç/<ayda1	Ayda 1-3	Haftada 1	Haftada 2-4	Haftada 5-6	Günde 1	Günde 2-3	Günde 4-5	Günde >6
Süt										
1.tam yağlı	**1**	☐	☐	☐	☐	☐	☐	☐	☐	☐
2.standart %2	**1**	☐	☐	☐	☐	☐	☐	☐	☐	☐
3.az yağlı	**1**	☐	☐	☐	☐	☐	☐	☐	☐	☐
Krem peynir (krem, karper, labne peynir)										
4.tam yağlı	**2**	☐	☐	☐	☐	☐	☐	☐	☐	☐
5.az yağlı	**2**	☐	☐	☐	☐	☐	☐	☐	☐	☐
Beyaz peynir (Beyaz peynir, tulum peyniri, çökelek ve lor)										
6.tam yağlı	**3a**	☐	☐	☐	☐	☐	☐	☐	☐	☐
7.az yağlı	**3a**	☐	☐	☐	☐	☐	☐	☐	☐	☐
Kaşar peynir, tel peynir, mihaliç peyniri, urfa peyniri										
8.tam yağlı	**3b**	☐	☐	☐	☐	☐	☐	☐	☐	☐
9.az yağlı	**3b**	☐	☐	☐	☐	☐	☐	☐	☐	☐
Yoğurt										
10.tam yağlı	**4**	☐	☐	☐	☐	☐	☐	☐	☐	☐
11.az yağlı	**4**	☐	☐	☐	☐	☐	☐	☐	☐	☐
12.Ayran	5	☐	☐	☐	☐	☐	☐	☐	☐	☐
Margarin										
13.katı	**6**	☐	☐	☐	☐	☐	☐	☐	☐	☐
14.sıvı	**5**	☐	☐	☐	☐	☐	☐	☐	☐	☐
15.Tereyağ	6	☐	☐	☐	☐	☐	☐	☐	☐	☐
16.Dondurma	7	☐	☐	☐	☐	☐	☐	☐	☐	☐
17.Krema	8	☐	☐	☐	☐	☐	☐	☐	☐	☐
18.Kaymak	8	☐	☐	☐	☐	☐	☐	☐	☐	☐

Meyveler	Ortalama miktar*	Hiç/<ayda1	Ayda 1-3	Haftada 1	Haftada 2-4	Haftada 5-6	Günde 1	Günde 2-3	Günde 4-5	Günde >6
19. Elma	9	☐	☐	☐	☐	☐	☐	☐	☐	☐
20. Muz	10	☐	☐	☐	☐	☐	☐	☐	☐	☐
21. Kivi	11	☐	☐	☐	☐	☐	☐	☐	☐	☐
22. Kuru meyveler										
üzüm	12a	☐	☐	☐	☐	☐	☐	☐	☐	☐
dut	12b	☐	☐	☐	☐	☐	☐	☐	☐	☐
kayısı	12c/e	☐	☐	☐	☐	☐	☐	☐	☐	☐
incir	12d	☐	☐	☐	☐	☐	☐	☐	☐	☐
23. Limon	tane	☐	☐	☐	☐	☐	☐	☐	☐	☐
Geçtiğimiz yıl aşağıda belirtilen meyveleri mevsiminde bir ay boyunca ne sıklıkta tükettiniz?										
24. Çilek	13	☐	☐	☐	☐	☐	☐	☐	☐	☐
25. Portakal	14	☐	☐	☐	☐	☐	☐	☐	☐	☐
26. Greyfurt	tane	☐	☐	☐	☐	☐	☐	☐	☐	☐
27. Üzüm	15	☐	☐	☐	☐	☐	☐	☐	☐	☐
28. İncir	16	☐	☐	☐	☐	☐	☐	☐	☐	☐
29. Erik	17	☐	☐	☐	☐	☐	☐	☐	☐	☐
30. Karpuz	18	☐	☐	☐	☐	☐	☐	☐	☐	☐
31. Kavun	19	☐	☐	☐	☐	☐	☐	☐	☐	☐
32. Nar	20	☐	☐	☐	☐	☐	☐	☐	☐	☐
33. Trabzon hurması	tane	☐	☐	☐	☐	☐	☐	☐	☐	☐
34. Kayısı	21	☐	☐	☐	☐	☐	☐	☐	☐	☐
35. Malta eriği(yeni dünya)	22	☐	☐	☐	☐	☐	☐	☐	☐	☐
36. Vişne	23	☐	☐	☐	☐	☐	☐	☐	☐	☐
37. Kiraz	24	☐	☐	☐	☐	☐	☐	☐	☐	☐
38. Dut	25	☐	☐	☐	☐	☐	☐	☐	☐	☐
39. Şeftali	26	☐	☐	☐	☐	☐	☐	☐	☐	☐
40. Armut	27	☐	☐	☐	☐	☐	☐	☐	☐	☐
41. Ayva	28	☐	☐	☐	☐	☐	☐	☐	☐	☐
42. Mandalina	tane	☐	☐	☐	☐	☐	☐	☐	☐	☐
43. Kızılcık	36b	☐	☐	☐	☐	☐	☐	☐	☐	☐

Geçtiğimiz yıl boyunca aşağıda belirtilen sebzeleri ne sıklıkta tükettiniz?

Sebzeler	Ortalama miktar*	Hiç/<ayda1	Ayda 1-3	Haftada 1	Haftada 2-4	Haftada 5-6	Günde 1	Günde 2-3	Günde 4-5	Günde >6
44.Patlıcan	61a	☐	☐	☐	☐	☐	☐	☐	☐	☐
45.Kabak	61a	☐	☐	☐	☐	☐	☐	☐	☐	☐
Havuç										
46.çiğ	**29**	☐	☐	☐	☐	☐	☐	☐	☐	☐
47.pişmiş	**29**	☐	☐	☐	☐	☐	☐	☐	☐	☐
Soğan										
48.çiğ	**27**	☐	☐	☐	☐	☐	☐	☐	☐	☐
49.pişmiş	**27**	☐	☐	☐	☐	☐	☐	☐	☐	☐
50.Marul	30	☐	☐	☐	☐	☐	☐	☐	☐	☐
51.Pancar	61a	☐	☐	☐	☐	☐	☐	☐	☐	☐
52.Şalgam	61a	☐	☐	☐	☐	☐	☐	☐	☐	☐
53.Brokoli	61a	☐	☐	☐	☐	☐	☐	☐	☐	☐
54.Mantar	61a	☐	☐	☐	☐	☐	☐	☐	☐	☐
55.Turp	27	☐	☐	☐	☐	☐	☐	☐	☐	☐
56.Yeşil fasulye	61a	☐	☐	☐	☐	☐	☐	☐	☐	☐
57.Yeşil taze bakla	61a	☐	☐	☐	☐	☐	☐	☐	☐	☐
58.Ispanak	61a	☐	☐	☐	☐	☐	☐	☐	☐	☐
Domates										
59.çiğ	**31**	☐	☐	☐	☐	☐	☐	☐	☐	☐
60.pişmiş	**61a**	☐	☐	☐	☐	☐	☐	☐	☐	☐
61.Pazı	61a	☐	☐	☐	☐	☐	☐	☐	☐	☐
62.Salatalık	32	☐	☐	☐	☐	☐	☐	☐	☐	☐
Lahana										
63.çiğ	**30**	☐	☐	☐	☐	☐	☐	☐	☐	☐
64.pişmiş	**61a**	☐	☐	☐	☐	☐	☐	☐	☐	☐
Biber (Kırmızı Salçalık)										
65.çiğ	**33**	☐	☐	☐	☐	☐	☐	☐	☐	☐
66.pişmiş	**61a**	☐	☐	☐	☐	☐	☐	☐	☐	☐
67.Maydanoz	34	☐	☐	☐	☐	☐	☐	☐	☐	☐
68.Bezelye	61a	☐	☐	☐	☐	☐	☐	☐	☐	☐
69.Bamya	61a	☐	☐	☐	☐	☐	☐	☐	☐	☐
70.Karnabahar	61a	☐	☐	☐	☐	☐	☐	☐	☐	☐
71.Mısır	1 çay bardağı	☐	☐	☐	☐	☐	☐	☐	☐	☐
72.Acı biber	33	☐	☐	☐	☐	☐	☐	☐	☐	☐
73.Pırasa	61a	☐	☐	☐	☐	☐	☐	☐	☐	☐
74.Balkabağı	100	☐	☐	☐	☐	☐	☐	☐	☐	☐

Geçtiğimiz yıl boyunca aşağıda belirtilen sebzeleri ne sıklıkta tükettiniz?

Sebzeler devam	Ortalama miktar*	Hiç/<ayda1	Ayda 1-3	Haftada 1	Haftada 2-4	Haftada 5-6	Günde 1	Günde 2-3	Günde 4-5	Günde >6
Zeytin		☐	☐	☐	☐	☐	☐	☐	☐	☐
75.yeşil	**36a**	☐	☐	☐	☐	☐	☐	☐	☐	☐
76.siyah	**36b**	☐	☐	☐	☐	☐	☐	☐	☐	☐
77. Kereviz	61a	☐	☐	☐	☐	☐	☐	☐	☐	☐
78. Enginar	61a	☐	☐	☐	☐	☐	☐	☐	☐	☐
Sarmısak										
79.çiğ	**diş**	☐	☐	☐	☐	☐	☐	☐	☐	☐
80.pişmiş	**diş**	☐	☐	☐	☐	☐	☐	☐	☐	☐
Yeşil biber (dolmalık, yeşil)										
81.çiğ	**33**	☐	☐	☐	☐	☐	☐	☐	☐	☐
82.pişmiş	**61a**	☐	☐	☐	☐	☐	☐	☐	☐	☐
Semizotu										
83. çiğ	**30**	☐	☐	☐	☐	☐	☐	☐	☐	☐
84. pişmiş	**61a**	☐	☐	☐	☐	☐	☐	☐	☐	☐
85. Nane taze	35	☐	☐	☐	☐	☐	☐	☐	☐	☐
86. Dereotu	34	☐	☐	☐	☐	☐	☐	☐	☐	☐

Geçtiğimiz yıl boyunca aşağıdaki kuru baklagilleri ortalama olarak ne sıklıkta tükettiniz?

Kuru Baklagiller	Ortalama miktar*	Hiç/<ayda1	Ayda 1-3	Haftada 1	Haftada 2-4	Haftada 5-6	Günde 1	Günde 2-3	Günde 4-5	Günde >6
Mercimek										
87.sade	**37**	☐	☐	☐	☐	☐	☐	☐	☐	☐
88.etli	**38**	☐	☐	☐	☐	☐	☐	☐	☐	☐
Kuru fasulye										
89.sade	**37**	☐	☐	☐	☐	☐	☐	☐	☐	☐
90.etli	**38**	☐	☐	☐	☐	☐	☐	☐	☐	☐
Nohut										
91.sade	**37**	☐	☐	☐	☐	☐	☐	☐	☐	☐
92.etli	**38**	☐	☐	☐	☐	☐	☐	☐	☐	☐
93. Börülce	37	☐	☐	☐	☐	☐	☐	☐	☐	☐
94. Fava	37	☐	☐	☐	☐	☐	☐	☐	☐	☐

Geçtiğimiz yıl boyunca yumurta ve et çeşitlerini ortalama olarak ne sıklıkta tükettiniz?

Et ve Yumurta	Ortalama miktar*	Hiç/<ayda1	Ayda 1-3	Haftada 1	Haftada 2-4	Haftada 5-6	Günde 1	Günde 2-3	Günde 4-5	Günde >6
Yumurta										
95.haşlanmış	**adet**									
96.yağda	**39**									
97.Sucuklu, pastırmal	40									
etli, peynirli yumurta										
98.Menemen ve diğer	41									
sebzeli yumurtalar										
Tavuk										
99.derili	**42**									
100.derisiz	**43**									
101.sebzeli	47 ya da 62a									
Koyun/kuzu										
102.yağlı	**44-46**									
103.yağsız	**45**									
104.sebzeli	**47 ya da 62a**									
Dana /sığır										
105.yağlı	**46**									
106.yağsız	**45**									
107.sebzeli	**47 ya da 62a**									
Köfte										
108.sade ızgara	**48**									
109.sade kızarmış	**48**									
110.sebzeli	**49**									
Balık										
111.kızarmış	**50a**									
112.buğulama / fırında	**50b/c**									
113.konserve	**kutu**									
114.lakerda/çiroz	**51**									
115. Pastırma	52									
116. Sucuk	53									
117. Salam	54									
118. Sosis	55									
119. Dil	56									
120. Beyin	yemek kaşığı									
121. Kelle	57									
122. Kokoreç	58									
123. Tuzlama	59									
124. İşkembe	59									
125. Ciğer	60									

Geçtiğimiz yıl boyunca aşağıdaki yemekleri ortalama olarak ne sıklıkta tükettiniz?

Yemekler	Ortalama miktar*	Hiç/<ayda1	Ayda 1-3	Haftada 1	Haftada 2-4	Haftada 5-6	Günde 1	Günde 2-3	Günde 4-5	Günde >6
Sebzeler										
126. sade	**61a**	☐	☐	☐	☐	☐	☐	☐	☐	☐
127. kızartmalar	**61c**	☐	☐	☐	☐	☐	☐	☐	☐	☐
Dolma ve sarmalar										
128.Zeytinyağlı	**62b**	☐	☐	☐	☐	☐	☐	☐	☐	☐
Çorbalar										
129.un, pirinç ya da hamurla (şehriye erişte, vb.) yapılan çorbalar	**63a**	☐	☐	☐	☐	☐	☐	☐	☐	☐
130.sebze çorbaları	**63b**	☐	☐	☐	☐	☐	☐	☐	☐	☐
131.domates çobası	**63b**	☐	☐	☐	☐	☐	☐	☐	☐	☐
132.yoğurtlu çorbalar	**63c**	☐	☐	☐	☐	☐	☐	☐	☐	☐
133.mercimek çorbası	**63d**	☐	☐	☐	☐	☐	☐	☐	☐	☐
134.tarhana çorbası	**63d**	☐	☐	☐	☐	☐	☐	☐	☐	☐
135.köfteli çorbalar	**63e**	☐	☐	☐	☐	☐	☐	☐	☐	☐
136.hazır çorbalar	**63b**	☐	☐	☐	☐	☐	☐	☐	☐	☐
Kızartılarak hazırlanan börekler										
137.ıspanaklı, sebzeli	**64a ya da 64b**	☐	☐	☐	☐	☐	☐	☐	☐	☐
138.peynirli, kıymalı,etli	**64a ya da 64b**	☐	☐	☐	☐	☐	☐	☐	☐	☐
Fırında pişirilen börekler										
139.ıspanaklı, sebzeli	**65a ya da 65b**	☐	☐	☐	☐	☐	☐	☐	☐	☐
140.peynirli, kıymalı,etli	**65a ya da 65b**	☐	☐	☐	☐	☐	☐	☐	☐	☐
Pizza										
141.ince	**66**	☐	☐	☐	☐	☐	☐	☐	☐	☐
142.kalın	**66**	☐	☐	☐	☐	☐	☐	☐	☐	☐
143. Lahmacun Gözleme,katmer	67	☐	☐	☐	☐	☐	☐	☐	☐	☐
144. ıspanaklı, sebzeli	**68**	☐	☐	☐	☐	☐	☐	☐	☐	☐
145.peynirli, kıymalı,etli	**68**	☐	☐	☐	☐	☐	☐	☐	☐	☐
146. Mantı sade	69	☐	☐	☐	☐	☐	☐	☐	☐	☐

Geçtiğimiz yıl boyunca aşağıdaki ekmek, tahıl ve nişasta türlerini ortalama olarak ne sıklıkta tükettiniz?

Ekmek ve tahıllar		Ortalama miktar*	Hiç/<ayda1	Ayda 1-3	Haftada 1	Haftada 2-4	Haftada 5-6	Günde 1	Günde 2-3	Günde 4-5	Günde >6
Pirinç											
147. sade	**70a**		☐	☐	☐	☐	☐	☐	☐	☐	☐
148. etli tavuklu	**70b**		☐	☐	☐	☐	☐	☐	☐	☐	☐
149. Pide	71		☐	☐	☐	☐	☐	☐	☐	☐	☐
Ekmek											
150. beyaz	**73a**		☐	☐	☐	☐	☐	☐	☐	☐	☐
151. esmer (işlenmemiş)	**73b**		☐	☐	☐	☐	☐	☐	☐	☐	☐
152. Yufka ekmeği	71		☐	☐	☐	☐	☐	☐	☐	☐	☐
153. Mısır ekmeği	72		☐	☐	☐	☐	☐	☐	☐	☐	☐
Bulgur											
154. sade	**74a**		☐	☐	☐	☐	☐	☐	☐	☐	☐
155. kısır gibi sebze katkılı	**74b**		☐	☐	☐	☐	☐	☐	☐	☐	☐
Makarna											
156. sade	**75a**		☐	☐	☐	☐	☐	☐	☐	☐	☐
157. sebzeli peynirli, kıymalı	**75b**		☐	☐	☐	☐	☐	☐	☐	☐	☐
158. etli	**75c**		☐	☐	☐	☐	☐	☐	☐	☐	☐
Patates											
159. kızarmış	**76a**		☐	☐	☐	☐	☐	☐	☐	☐	☐
160. haşlanmış	**76b**		☐	☐	☐	☐	☐	☐	☐	☐	☐
161. patates püresi	**77**		☐	☐	☐	☐	☐	☐	☐	☐	☐
162. Musli	78a		☐	☐	☐	☐	☐	☐	☐	☐	☐
163. Mısır gevreği	78b		☐	☐	☐	☐	☐	☐	☐	☐	☐
164. Poğaça	79		☐	☐	☐	☐	☐	☐	☐	☐	☐
165. Açma	80		☐	☐	☐	☐	☐	☐	☐	☐	☐
166. Simit	81		☐	☐	☐	☐	☐	☐	☐	☐	☐
Bisküvi											
167 normal	**82**		☐	☐	☐	☐	☐	☐	☐	☐	☐
168 diyet	**82**		☐	☐	☐	☐	☐	☐	☐	☐	☐
169. Patlamış mısır		Su bardağı	☐	☐	☐	☐	☐	☐	☐	☐	☐
170. Közlenmiş / haşlanmış mısır	83		☐	☐	☐	☐	☐	☐	☐	☐	☐
171. Közlenmiş / haşlanmış kestane	84		☐	☐	☐	☐	☐	☐	☐	☐	☐

Geçtiğimiz yıl boyunca aşağıdaki içecekleri ortalama olarak ne sıklıkta tükettiniz?

Alkolsüz içecekler	Ortalama miktar*	Hiç/<ayda1	Ayda 1-3	Haftada 1	Haftada 2-4	Haftada 5-6	Günde 1	Günde 2-3	Günde 4-5	Günde >6
Kahve										
172.Türk Kahvesi	çay kaşığı									
173.Çözünebilir K.	çay kaşığı									
174. Çay	çay bardağı									
175. Kola, Pepsi, fanta, gazoz	su bardağı									
176. Diyet kola, gazoz	su bardağı									
177. Meyve suyu	85									
178. Limonata	85									
179. Şerbet	85									
180. Hoşaf	86									

Geçtiğimiz yıl boyunca aşağıdaki alkollü içecekleri ortalama olarak ne sıklıkta tükettiniz?

Alkollü içecekler	Ortalama miktar*	Hiç/<ayda1	Ayda 1-3	Haftada 1	Haftada 2-4	Haftada 5-6	Günde 1	Günde 2-3	Günde 4-5	Günde >6
181. Bira	su bardağı									
182.Rakı	87									
183. Şarap	88									
184. Votka, cin, viski	su bardağı									

Geçtiğimiz yıl boyunca aşağıdaki kuruyemişleri ortalama olarak ne sıklıkta tükettiniz?

Kuruyemişler	Ortalama miktar*	Hiç/<ayda1	Ayda 1-3	Haftada 1	Haftada 2-4	Haftada 5-6	Günde 1	Günde 2-3	Günde 4-5	Günde >6
185. Ayçekirdeği	89									
186. Kabak çekirdeği	90									
187. Leblebi	91									
188. Antepfıstığı	92									
189. Ceviz	93									
190. Badem	94									
191. Fındık	95									
192. Yer fıstığı	96									

Geçtiğimiz yıl boyunca aşağıdaki abucubur ve tatlılar ortalama olarak ne sıklıkta tükettiniz?

Tatlı ve atıştırmalık	Ortalama miktar*	Hiç/<ayda1	Ayda 1-3	Haftada 1	Haftada 2-4	Haftada 5-6	Günde 1	Günde 2-3	Günde 4-5	Günde >6
193. Cips, krakerler	97a ve 97b									
194. Baklava, kadayıf, künefe, revani, şambaba gibi fırında pişirilen tatlılar	98									
195. Tulumba, lokma, hanım göbeği, bademiye gibi kızartılan tatlılar vb)	99									
196. Ayva tatlısı, kabak tatlısı gibi sebze ve meyveli tatlılar	100									
197. İrmik helvası	101									
198. Un helvası	102									
199. Tahin helvası	103									

Geçtiğimiz yıl boyunca aşağıdaki abucubur ve tatlılar ortalama olarak ne sıklıkta tükettiniz?

Tatlı ve atıştırmalar devam	Ortalama miktar*	Hiç/<ayda1	Ayda 1-3	Haftada 1	Haftada 2-4	Haftada 5-6	Günde 1	Günde 2-3	Günde 4-5	Günde >6
200. Muhallebi sütlaç	104	☐	☐	☐	☐	☐	☐	☐	☐	☐
201. Kazandibi tavuk göğsü	104	☐	☐	☐	☐	☐	☐	☐	☐	☐
202. Aşure	105	☐	☐	☐	☐	☐	☐	☐	☐	☐
203. Kek	106	☐	☐	☐	☐	☐	☐	☐	☐	☐
204. Yaş pasta	107	☐	☐	☐	☐	☐	☐	☐	☐	☐
205. Şeker çay kaşığı ya da adet		☐	☐	☐	☐	☐	☐	☐	☐	☐
206. Şekerleme	108	☐	☐	☐	☐	☐	☐	☐	☐	☐
207. Çikolata	109	☐	☐	☐	☐	☐	☐	☐	☐	☐
208. Çikolatalı bar	109	☐	☐	☐	☐	☐	☐	☐	☐	☐
209. Gofret	110	☐	☐	☐	☐	☐	☐	☐	☐	☐
210. Bal reçel	111	☐	☐	☐	☐	☐	☐	☐	☐	☐
211. Ne sıklıkta dışarıda yemek yersiniz (hazır yemek ya da lokantalarda)		☐	☐	☐	☐	☐	☐	☐	☐	☐

Vitaminler

212. Düzenli olarak vitamin alır mısınız? ☐ Hayır ☐ Evet

213. Düzenli olarak mineral alır mısınız? ☐ Hayır ☐ Evet

Eğer evetse kaç yıldır ve ne sıklıkta kullandınız?

	Bir yıldan kısa		1-3 yıl		4-6 yıl		6 yıldan uzun	
	Sıkça	Ara sıra	Sıkça	Ara sıra	Sıkça	Ara sıra	Sıkça	Ara sıra
214. A vitamini	☐	☐	☐	☐	☐	☐	☐	☐
215. D vitamini	☐	☐	☐	☐	☐	☐	☐	☐
216. E vitamini	☐	☐	☐	☐	☐	☐	☐	☐
217. B vitamini	☐	☐	☐	☐	☐	☐	☐	☐
218. C vitamini	☐	☐	☐	☐	☐	☐	☐	☐
219. Kalsiyum	☐	☐	☐	☐	☐	☐	☐	☐
220. Demir	☐	☐	☐	☐	☐	☐	☐	☐
221. Çinko	☐	☐	☐	☐	☐	☐	☐	☐
222. Multivitamin preratı	☐	☐	☐	☐	☐	☐	☐	☐

Evinizde ne tür yağ kullanırsınız, yağ kullanma sıklığınız nedir?

	Ortalama miktar*	Hiç/<ayda1	Ayda 1-3	Haftada 1	Haftada 2-4	Haftada 5-6	Günde 1	Günde 2-3	Günde 4-5	Günde >6
223. Zeytinyağı	1 çorba kaşığı	☐	☐	☐	☐	☐	☐	☐	☐	☐
224. Çiçek yağı	1 çorba kaşığı	☐	☐	☐	☐	☐	☐	☐	☐	☐
225. Mısır yağı	1 çorba kaşığı	☐	☐	☐	☐	☐	☐	☐	☐	☐
226. Soya yağı	1 çorba kaşığı	☐	☐	☐	☐	☐	☐	☐	☐	☐
227. Bitkisel yağ (katı)	1 çorba kaşığı	☐	☐	☐	☐	☐	☐	☐	☐	☐
228. Pamuk yağı	1 çorba kaşığı	☐	☐	☐	☐	☐	☐	☐	☐	☐
229. Hidrojenlenmiş bitkisel yağ (sıvı)	1 çorba kaşığı	☐	☐	☐	☐	☐	☐	☐	☐	☐

8.4. CURRICULUM VITAE

Personal Informations

Name	Yeşim	**Surname**	Köylüoğlu

Degree	**Department**	**The name of the Institution Graduated From**	**Graduation year**
Master	Nutrition and Dietetics	Yeditepe University	2024
University	Nutrition and Dietetics	Yeditepe University	2021
High School	-	Lake-Lehman High School Private Sanko High School	2016 2017

Foreign Languages	**Foreign Language Score**
English	83,75 (YDS)

Work Experience

Position	**Institute**	**Duration**
Dietitian	Havuç App	3 months
Blog Writer	Bezelye Dergi	3 years 2 months

Computer Skills

Program	**Level**
Microsoft Office Programs	Good
SPSS	Average

Others (Projects / Certificates / Rewards)

American Diabetes Association (ADA), Beyond the Basics: Unraveling Challenging Type 2 Diabetes Cases – 2024
American Diabetes Association (ADA), Diabetes Technology and Nutrition: Getting the Conversation Started Recording – 2024
Ludwig-Maximilians-Universität München (LMU), Nutrition and Lifestyle in Pregnancy – 2020
Emory University, Weight Management: Beyond Balancing Calories – 2020
University of California, Irvine, Essentials of Entrepreneurship: Thinking & Action – 2020
University of Copenhagen, Diabetes – the Essential Facts - 2020