

T.C.
YEDİTEPE UNIVERSITY
INSTITUTE OF HEALTH SCIENCES
DEPARTMENT OF NUTRITION AND DIETETICS

**CONSUMPTION OF MILK AND DAIRY PRODUCTS
AMONGST UNIVERSITY STUDENTS,
RELATIONSHIP BETWEEN CALCIUM TAKEN
FROM MILK AND DAIRY PRODUCTS AND
ANTHROPOMETRIC MEASUREMENTS**

MASTER THESIS

DIETİTİAN & NURSE YEŞİM NURDAN ÖZKORUCUKLU

İSTANBUL-2018

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İSTANBUL-2018

TEZ ONAYI FORMU

Kurum : Yeditepe Üniversitesi Sağlık Bilimleri Enstitüsü


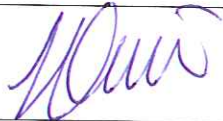
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Tez Sahibi : YeşimNurdan ÖZKORUCUKLU

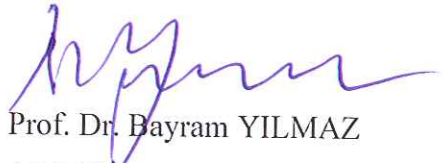
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ONAY

Bu tez Yeditepe Üniversitesi Lisansüstü Eğitim-Öğretim ve Sınav Yönetmeliğinin ilgili maddeleri uyarınca yukarıdaki jüri tarafından uygun görülmüş ve Enstitü Yönetim Kurulu'nun 11/05/2018 tarih ve 2018/08-07 sayılı kararı ile onaylanmıştır.


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DECLARATION

I hereby declare that; this thesis is my own work, I did not show unethical behaviour throughout the whole process from planning to writing, I obtained all knowledge in the thesis staying within academic and ethical rules, I cited and included all content that was not obtained by thesis work in the bibliography and I made no patent or copyright infringements.

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YeşimNurdan ÖZKORUCUKLU

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TABLE of CONTENTS

APPROVAL PAGE.....	ii
DECLARATION.....	iii
ACKNOWLEDGEMENTS.....	iv
TABLE of CONTENTS	v
LIST of TABLES.....	vii
ABBREVIATIONS and SYMBOLS.....	ix
LIST OF APPENDICES.....	x
ABSTRACT.....	xi
1.INTRODUCTION.....	1
2.GENERAL KNOWLEDGE	4
2.1. What is Nutrition.....	4
2.2. Food and Food Groups.....	4
2.2.1. Meat and meat products, eggs and legumes	5
2.2.2. Fruits and vegetables	6
2.2.3. Bread and cereals.....	7
2.2.4. Milk and dairy products	7
2.3. Milk and Dairy Products Consumption Habits of University Students	12
2.4. Methods Used to Determine Nutritional Status	12
2.4.1. Detection of food intake.....	13
2.5. Calcium	15
2.5.1. Functions of calcium	15
2.5.2. Health effects of calcium.....	16
2.5.3. Calcium requirement.....	16
2.5.4. Calcium-containing foods	17
2.6 What is Obesity	17
2.6.1. Causes of obesity.....	17
2.6.2. Prevalance of obesity.....	18
2.6.3. Obesity diagnosis and treatment.....	18
2.7. The Relationship Between Obesity and Calcium.....	19
3. MATERIALS and METHODS	22
3.1 Type of Research.....	22
3.2. Universe and Sample of Research	22
3.3. Inclusion and Exclusion Criteria.....	22
3.4. Data Collection Tools.....	22

3.5. Evaluation of Data.....	23
3.6. Ethical Aspect of the Research.....	23
3.7. Limitations of the Research.....	24
3.8. Research Questions	24
3.9. Cooperation with People and Institutions for Conducting the Research	24
4. RESULTS	25
5. DISCUSSION and CONCLUSION	48
6. REFERENCES	54

LIST of TABLES

Table 2.1. Nutritional Values in 100 Grams of Milk and Dairy Products	10
Table 2.2. Classification According to Body Mass Index (BMI)	14
Table 2.3. Classification According to Waist Circumference.....	15
Table 2.4.. Daily Requirement of Calcium	16
Table 4.1. Distribution of Participants According to Socio-Demographic Properties...	25
Table 4.2. Distribution of Participants According to BMI Values	26
Table 4.3. Distribution of Participants According to Anthropomorphic Features	27
Table 4.4. Min. and max. Values of Anthropometric Measurements of Participants According to Their Departments	28
Table 4.5. Comparison of Anthropometric Measurements of Participants According to Their Departments	29
Table 4.6. Distribution of Participants According to their Consumption of Milk and Dairy Products	31
Table 4.7. Comparison of Milk and Dairy Products Consumption Habits of Participants According to Their Department of Study	33
Table 4.8. Comparison of Participants According to Their Levels of Knowledge of Daily Needed Amount of Calcium Intake for 19-55 Years of Age	35
Table 4.9. Comparison of Milk and Dairy Products Consumption Habits of Participant According to Whether Nutritional Education is Taken or Not.....	36
Table 4.10. Distribution of Participants According to their Consumption Frequency of Milk and Dairy Products.....	37
Table 4.11. Average, Min. and Max. Values of Calcium Intake According to the Type of Dairy Products Consumed by Participants	40
Table 4.12. Distribution of Participants According to Their Consumption of Milk and Dairy Products	41
Table 4.13. Distribution of Participants According to Their Calcium Intake from Consumption of Milk and Dairy Products (Each Meal – Each Day)	42

Table 4.14. Comparison of Amount of Calcium Taken from Milk and Dairy Products Consumed Every Day and at Every Meal by Department of Study	43
Table 4.15. Comparison of Amount of Calcium Taken from Milk and Dairy Products on Each Day and Each Meal According to BMI Values of Participants	44
Table 4.16. Comparison of Amount of Calcium Taken from Milk and Dairy Products on Each Day and Each Meal According to Waist-to-Hip Ratio Values of Participants.	45
Table 4.17. Comparison of Milk Consumption Habits of Participants According to Their BMI Measurements	46
Table 4.18. Comparison of Dairy Products Consumption Habits of Participants According to Their BMI Measurements	47

ABBREVIATIONS and SYMBOLS

BMI	: Body Mass Index
Ca⁺⁺	: Calcium
Cm	: Centimeter
FFQ	: Food Frequency Form
Kg	: Kilogram
Max.	: Maximum
Mg	:Miligram
Min.	: Minimum
n	: Sample Size
p	: Difference Value
SPSS	: Statistical Package for the Social Sciences
Std.dev	: Standard Deviation
TBSA	:Turkish Research for Nutrition and Health
TÜİK	: Turkish Statistical Institution
USDA	:United States Department of Agriculture
WHO	: World Health Organization

LIST of APPENDICES

Appendix-1:General Information Form

Appendix-2:Food Frequency Form (FFQ)

Appendix-3:Ethical Board Approval Form

Appendix-4:CurriculumVitae

ABSTRACT

Özkorucuklu, Y.N. (2018). Consumption of Milk and Dairy Products amongst University Students, Relationship Between Calcium Taken from Milk and Dairy Products and Anthropometric Measurements. YeditepeUniversity Graduate School of Health Sciences, Department of Nutrition and Dietetics, Master Thesis, Istanbul.

This research aims to determine the milk and dairy product consumption habits of university students, differences between consumption frequency and knowledge levels of groups according to being trained in nutrition or not, and the correlation between calcium intakes of these groups and their body mass index and waist-to-hip ratios. 200 3rd and 4th year students, mainly studying in departments of Nursing, Nutrition and Dietetics, Graphic Design and Architecture, were included in the sample. However, since number of male students in healthrelated departments negatively affects the comparison of anthropometric measurements, they were left outside the study by being excluded from the statistical segment of the research. Study was conducted with female students only. Data was collected between the dates of 15 July and 15 August, using General Information Form and Food Frequency Form prepared by the researcher. Approval of the ethical board and verbal consent of participating students were taken in order to conduct the research. Analysis of data were done in Statistical Package for the Social Sciences 20.0 software and percentage distribution, chi-square test and T tests were used for the analysis. While 88 of participants were identified as having milk drinking habits, 52 people reported not drinking milk due to reasons such as disgust and nausea. While it is observed that not all of those who claimed knowing the amount of calcium in milk and dairy products can correctly identify these values; it was also seen that participant claiming knowledge of daily amount of calcium also failed to correctly report these values. When body mass index and waist-to-hip raito values of participants were examined according to their departments; it was observed that number of those with a body mass index higher than 25 kg/m² is higher in helath-related departments than in non-health-related ones. When the correlation between daily calcium intake from milk and dairy products (those who consume it every day and at every meal was taken into account) and body mass index is examined; it was seen that majority of participants who consume less than 600 mg have body mass index values higher than 25 kg/m². Finally, it is shown that university students have the habit of milk and dairy

product consumption and there is difference regarding this between individuals who have taken his education and those who have not. Adequate consumption of milk and dairy products is determined to be correlated with normal body mass index. Further research is needed and suggested to be done due to the existence of research with contrasting results on the subject.

Keywords: Milk and dairy products, calcium, body mass index, waist-to-hip ratio, university students

ÖZET

Özkorucuklu, Y.N. (2018). Üniversite Öğrencilerinde Süt ve Süt Ürünleri Tüketimi, Süt ve Süt Ürünleri ile Alınan Kalsiyumun Antropometrik Ölçümlerle İlişkisi. Yeditepe Üniversitesi Sağlık Bilimleri Enstitüsü, Beslenme ve Diyetetik ABD. Master Tezi. İstanbul.

Bu araştırma üniversite öğrencilerinin süt ve süt ürünleri tüketim alışkanlıkları, beslenme eğitimi alan ve almayan gruplar arasındaki bilgi düzeyleri ile tüketim sıklığı farklılıkları ve bu grupların kalsiyum alımları ile beden kütle indeksleri, bel/kalça oranları arasındaki ilişkiyi belirlemek amacıyla yapılmıştır. Örneklem başlangıçta Hemşirelik, Beslenme ve Diyetetik, Grafik Tasarımı ve Mimarlık Bölümlerinde okuyan 3. ve 4. sınıf öğrencileri olmak üzere 200 kişi dahil edilmiştir. Ancak sağlık alanı ile ilgili bölümlerde erkek öğrenci sayısı antropometrik ölçümlerin karşılaştırılması olumsuz etkilediği için erkek öğrenciler çalışmanın istatiki kısmına dahil edilmeyerek çalışma dışı bırakılmıştır. Araştırmaya kadın öğrencilerle yürütülmeye devam edilmiştir. Araştırma verileri 15 Temmuz – 15 Ağustos tarihleri arasında araştırmacı tarafından hazırlanan Genel Bilgi Formu ve Besin Tüketim Sıklığı Formu ile toplanmıştır. Araştırmanın yürütülmesi için etik kurul onayı ve katılan öğrencilerin gönüllülüğü ve sözlü onayı alınmıştır. Verilerin analizi Statistical Package For the Social Sciences 20.0 programında değerlendirilmiş ve verilerin analizinde, yüzdelik dağılım ki-kare testi, T testi kullanılmıştır. Katılımcıların 88'inin süt içme alışkanlığı olduğu saptanırken 52 kişi ise tikslenme ve mide bulantısı gibi nedenler ile süt içmediklerini belirtmişlerdir. Süt ve süt ürünlerinin içerdiği kalsiyum miktarını bildiğini ifade eden kişilerin tamamı bu değerleri doğru bilemezken, günlük kalsiyum miktarını biliyorum diyenlerin çoğunluğu da bu miktarı doğru olarak belirtememişlerdir. Katılımcıların bölümlerine göre beden kütle indeksleri ve bel/kalça oranları incelendiğinde sağlıkla ilgili olan bölümlerde beden kütle indeksi >25 kilogram/metre² olan bireylerin oranı sağlıkla ilgili olmayan bölümlerden daha az olduğu tespit edilmiştir. Süt ve süt ürünlerinden (her gün ve her öğün tüketenler dikkate alınmıştır) gelen günlük kalsiyum tüketim miktarı ve beden kütle indeksleri arasındaki ilişki incelendiğinde ise <600 miligram tüketen katılımcıların çoğunluğunun beden kütle indeksinin >25 kilogram/metre² sınıfında yer aldığı görülmüştür. Sonuç olarak, üniversite öğrencilerinde süt ve süt ürünleri tüketim alışkanlığı olduğu gösterilmiş ve bu konuda eğitim almış bireylerle almamışlar arasında tüketim farklılığı olduğu

görülmüştür. Katılımcıların yeterli süt ve süt ürünleri tüketimi ile normal beden kütle indeksi ve bel/kalça oranı arasında ilişki olduğu saptanmıştır. Konu ile ilgili aksi yönde olan çalışmaların varlığı kesin bilgi elde edilebilmesi için daha fazla araştırma yapılmasını gerektirmekte ve önerilmektedir.

Anahtar kelimeler: Süt ve süt ürünleri, kalsiyum, beden kütle indeksi, bel/kalça oranı, üniversiteöğrencileri

1. INTRODUCTION

Nutrition is the ability to obtain and use nutritional items that are needed by the body to survive, starting from the mother's womb and continuing until death (1, 2). Nutrition, which is defined as obtaining and using the nutrients in required quantities and in a balanced manner (1) in order to preserve the health of the living, to make the movements and tasks they need and to develop; or as a process involving the steps of obtaining, digesting, absorbing and metabolising the nutrients in the body (3, 4); is a vital process for the individual to continue their life (5). Therefore, it is necessary that the nutrients and the energy needed by the individual according to their age, sex and physiological environment is provided to the body continuously, economically and regularly in the required quantity, variety and quality. Such a diet can be called an adequate and balanced diet (1, 6).

Since nutrition has behavioural aspects besides physiological ones, a good eating habit is needed to be gained for an adequate and balanced diet. Eating habits vary from one individual to another, depending on factors such as age, sex, society, beliefs and food groups that are consumed. While the most important period for gaining eating habits is the early life, one of the risky periods that these habits may change because of various reasons is the university years. It is thought that eating habits gained during this period are carried along to the periods after university education. It is important that eating behaviours and the level of knowledge of students are identified and their awareness increased, in order to avoid problems that may be caused by unhealthy eating in later ages (7, 8, 9, 10).

It was observed in the research conducted that university students have one meal a day and are directed to ready-to-eat and unnecessary food and beverages. Their eating habits are transformed by seek for acceptance, changes in personal relations, stress, anxiety, economic hardships and conditions of dormitory environment (7, 8, 9, 10, 11, 12, 13).

A healthy diet must consist of a balanced distribution of all four basic food groups: milk and dairy products, meat/eggs and legumes, bread and grains/cereal, fruits and vegetables. Milk and dairy products, which is one of four basic food groups, plays an important role on normal growth, development and sustaining the health, containing 15 essential nutrients, therefore is needed to be consumed by every age group in suggested quantities (5, 4, 15). During university years, as eating habits change, consuming habits of milk and dairy products also change due to reasons such as the

thought that milk is a drink for childhood period, its taste, smell as well as economic conditions and education (10, 16).

While milk contains amino-acids and fatty acids that are essential for life; lactose, milkfat, casein, lactalbumine and lactoglobulin are components that are present solely in milk. Lactose is the essential carbohydrate of milk. Milkfat influences the appearance, taste and durability of milk. Cow milk, which contains high quality proteins consists of 3-3.5% proteins. Almost all vitamins that are essential for humans are present in milk. Vitamins A, D, E and K are associated with the fat in milk (5, 17).

Although there are positive outcomes of a balanced and adequate diet that includes all food items such as milk and dairy products, many negative results are likely to appear in the opposite case, an inadequate and unbalanced diet. These results can be listed as disruptions in growth, development and bodily functions, weakening of the immune system, worsening of the course of illnesses, longer treatment, mental retardation and an unbalanced body weight (3, 18). Due to the effects of an unhealthy diet on weight, Body Mass Index (BMI), which is the ratio between the weight and height squared, as well as the waist-to-hip ratio, has an important role on nutrition. These numbers provide information on whether the individual has a normal body weight, is underweight, overweight or obese. BMI and waist-to-hip ratio are two of important anthropometric measurements used as criteria for obesity diagnosis (19, 20). Obesity is regarded as a disease, prevalence of which recently increased dramatically both in wealthier Western countries and poor countries, affected by nutritional imbalance, neuroendocrine, genetic deformation and physical inactivity. Obesity is defined by World Health Organisation (WHO) as an excessive accumulation of fat in the body that deteriorates health (5, 21).

The fact that nutritional causes play a key role in BMI balance and waist-to-hip ratio, which are important criteria in obesity diagnosis, and that dietary calcium is a significant food item whose influence on body weight control is being discussed in recent research, brings up the question of whether there is a correlation between obesity and calcium. A number of epidemiological research conducted abroad, argues that long-term daily usage of milk and dairy products is related to the decrease in body weight and fat mass (19, 22, 23, 24). In line with this view, clinical and experimental research done for 10 years confirm the effect of calcium on adipose tissue (19).

Milk consumption is important in all periods. However, a new period starts for the nutrition of university students due to factors such as leaving their families, being

more prone to external influence and making their free decisions more significantly. It is aimed in this research to determine students' habits of dairy consumption, their level of information regarding this food group, differences of consumption frequency between groups with or without an education of nutrition, their calcium intake and parallel to these, their anthropometric measurements and its correlation with obesity.

2. GENERAL INFORMATION

2.1. What is Nutrition

Human needs are classified according to their priorities by psychologist Abraham H. Maslow. A concept as old as human history, nutrition as a word appeared first in 1551. Derived from Latin word “nutrire”, takes the first place in this hierarchy (4, 6, 17). Nutrition is a phenomenon required for all living things to grow, develop, maintain their health and survive, therefore is one of the most important needs for humans (25). Nutrition as a physiological phenomenon is the fulfilling the energy required for maintaining the metabolic activities from food items (6, 26).

An adequate and balanced diet is also very important in order to preserve and improve the health as well as to decrease the risk of metabolic diseases. Adequate and balanced diet can be defined as the intake of four food groups; dairy products, meat/eggs/legumes, grains/cereal and fruits/vegetables; in a balanced distribution and in the required amount, which are required energy and food items that are essential for growth, development and maintaining the health (13). The basic principle of an adequate and balanced diet is to take into account the age, sex and physiological condition of the individual when making choices of food (4, 7).

Nutrition and adequate and balanced diet are not only being full, but essential concepts for life (7).

2.2. Food and Food Groups

Food is animal and plant tissue that can be eaten, that consists of water, organic and inorganic items and cannot be synthesised by human body. Food is the prerequisite for nutrition. The way of distinguishing the type of eating habit individuals have is the food that is consumed by them (4, 6). Healthy nutrition is provided by food that is taken in the appropriate time and in the sufficient amount (18). Determining which animal and plant tissues that are eaten or drunk are consumed as food depends largely on the kind of food that the body or human physiology needs. The concept of food is investigated as food items and food groups (4). Food items are handled in six groups such as carbohydrates, proteins, fats, water, vitamins and minerals (18). Food groups are; milk and dairy products, meat and meat products, fruits and vegetables and grains and cereal (15). At the time when research on nutrition first started, this kind of a grouping is started to be made and daily amount of intake of these are also determined. This method

of four food groups is also adopted in Turkey when planning the essential foods that are required to be taken daily. This is symbolized by a four-leaf clover (11, 27, 28).

2.2.1. Meat and meat products, eggs and legumes.

Housing proteins, iron, zinc, iodine, phosphorus, magnesium, vitamins A, D, K and B, fibre, niacin and thiamine; red meat, fish, chicken, eggs, lentils, chickpeas, haricot beans, oily seeds are examined in this group (15, 18, 28).

Daily suggested intake of meat, eggs and legumes according to age groups are as follows: 1 to 1.5 portions for 1-3 years, 1,5 portions for 4-6 and 7-9 years, 2 to 3 portions for 10-18 years, 2,5 to 3 portions for adults and individuals over the age of 65 (11, 15, 27, 28).

Meat:

The meat of cattle and sheep is classified as red meat whereas the meat of winged animals and seafood is classified as white meat. Apart from the fact that meat has a high content of proteins and minerals such as vitamin B12, iron and zinc; it also has a high amount of saturated fat and cholesterol. Meat must be a part of the diet and consumed in periods of pregnancy and breastfeeding, infancy and childhood, when protein requirement is increased in the body (11, 15, 27, 28).

Eggs:

Eggs are known as the food with the highest protein quality as all (100%) of its proteins are converted into body proteins. Egg yolk is full of fat, iron, vitamins A and of group B. Apart from the fact that infants and children are suggested to consume one egg a day, during illnesses such as kidney and liver failure, where the amount of proteins is limited, eggs are an important source for proteins (11, 15, 27, 28).

Legumes:

Legumes are types of food that are low in fat content, consisting mostly of polyunsaturated fatty acids, rich of minerals such as calcium, zinc, magnesium, iron and all group B vitamins except B12, and high in fibre content. Legumes are high in protein content. However, they have a low protein quality due to the fact that they are limited in

essential sulphur-containing amino-acids, high in fibre content and difficult to digest. Their protein quality can be improved when mixed with grains and cereals and cooked well (11, 15, 27, 28).

Oily seeds (Nuts):

Hazelnuts, sesame, walnuts and almonds are examples of oily seeds. Rich of group B vitamins, minerals, fats and proteins. They contain vitamin E and flavonoids and they are beneficial to add to the diets of children and heavy workers, due to their high fat content (11, 15, 27, 28).

2.2.2. Fruits and vegetables

Fruits and vegetables are rich of compounds such as folic acid, beta-carotene (a precursor to vitamin A), lycopene, lutein, vitamins E, C, K, B2 and B6, calcium, potassium, magnesium, fibre and other antioxidants, and have a low sodium content. Food items that are present in fruits and vegetables are beneficial for immune system, cell renewal, tissue regeneration, skin and eye health, in maintaining cognitive functions, generation of blood cells, regulation of blood pressure, maintaining bone and dental health and a health bowel function. Fruits and vegetables are protective against obesity as they are rich in water and dietary fibre and have low energy content, also providing the feeling of fullness by lengthening the chewing time. A minimum of two portions of green vegetables, citrus and tomatoes must be present in our daily diet. Daily suggested intake of fruits and vegetables according to age groups are as follows: 2,5 portions for 1-3 years, 3,5 portions for 4-6 years, 4 portions for 7-9 years, 5 portions for 10 years and older (11, 15, 27, 28).

Vegetables:

Vegetables are edible parts of plants. While roots and tubers are called starchy vegetables, dark green leaved, red and orange vegetables can be classified as non-starchy. Dark green leaved vegetables are broccoli, spinach, red cabbage, purslane, lettuce, kale and chard. Red and orange vegetables are red pepper and tomato. Starchy vegetables are potato, peas, carrot and Jerusalem artichokes. Other vegetables are green beans, onion, leek, garlic, zucchini and aubergine (11, 15, 27, 28).

Fruits:

Fruits are edible parts of plants such as the flowers and the seeds. Divided into two groups as citrus (orange, tangerine, grapefruit, lemon and juices) and others (apple, pear, grapes, melon, watermelon, strawberry, apricot, sour cherry, peach and their dried versions) (11, 15, 27, 28).

2.2.3. Bread and cereals

Grains such as wheat, rice, corn, rye, oats and products made from them such as flour, bulgur etc. are in the group of bread and cereals, an essential food group for the society. They are good sources of energy due to their high carbohydrate content. They also have a low content of proteins and fats and rich of fibre and group B vitamins (found mainly on shells and insides of grains) except B12. When consumed alongside milk and dairy products, their protein and vitamin content is also increased (11, 15, 27, 28).

Daily suggested intake of bread and cereals according to age groups are as follows: 2 portions for 1-3 years, 3 portions for 4-6 years, 5 portions for 7-9 years, 9 portions for males and 7 portions for females between 10-18 years, 8 portions in adult males, 7 portions for adult females, 5 portions for elderly males and 4 portions for elderly females. (11, 15, 27, 28).

2.2.4. Milk and dairy products

2.2.4.1. Definition of milk

Milk is an essential food secreted by mammals for fulfilling the needs of a new-born baby and the growth of young animals, which is also utilized by humankind (29). According to Turkish Standards (TS) Raw Milk Standard: "Milk is the white or cream liquid that is secreted from the mammary glands of a cow, sheep, goat or buffalo, has a distinct taste and consistency, to which no substance is mixed into or none taken out of." According to Turkish Food Codex: "Raw milk is the secretion of mammary gland except colostrum that is obtained by milking of one or more cows, goats, sheep or buffalo and that is not heated to more than 40 °C or not processed in a way that would mimic this heating process" (3).

2.2.4.2. Nutritional contents of milk and dairy products

Milk generally consists of carbohydrates, fats, water, vitamins and minerals. Seasonal changes, physiological factors, type and nutritional status of the animal can affect this content. Energy content of milk varies according to the type of milk (30).

Carbohydrates;

In pure milk, energy content is created by macro food items such as carbohydrates, fats and proteins (17, 31). Synthesized in mammary glands, lactose, which forms 54% of the dry matter except the fat, is the main carbohydrate of milk. Pure cow milk contains 4,7% lactose on average (31). Milk also contains glucose, galactose and oligosaccharides in small quantities. Low-lactose or lactose-free milk can be produced industrially by using the lactase enzyme (5, 17).

Fat;

Fat stands as microscopic globules in water emulsion. Milkfat influences the appearance, taste and durability of milk. It also creates a source for energy, fat soluble vitamins and essential fatty acids. Milk contains triglycerides (97-98%), phospholipids (0,2-1,0%), free sterols (0,22 - 0,41%), free fatty acids, fat-soluble vitamins (A, D, E, K) and more than 400 different fatty acids and their derivatives (5, 17). Despite containing 5% saturated fats, milk is important for health since it contains special compounds such as conjugated linoleic acid, sphingomyelin, butyric acid and myristic acid, which are beneficial against chronic disease (5, 26).

Protein;

High-quality-protein-containing cow milk is 3 to 3,5 % protein. Cow milk protein is a heterogeneous mixture consisting of mainly casein and whey, but also enzymes and nitrogen in small amounts that are non-protein compounds (32). Nearly 80% of the total protein is casein (8% inorganic matter, 92% protein), and 20% is whey. Milk protein, which is rich of essential amino acids such as leucine, isoleucine, valine, methionine, phenylalanine, threonine, tryptophan and lysine; is considered as quality protein and used as a standard reference for evaluation of protein quality in foods (5, 23, 26). Amino acids that forms the protein structure are found in milk and dairy products in significant quantities. Essential (leucine, lysine, isoleucine, valine, methionine,

phenylalanine, threonine, tryptophan and partly histidine and arginine) and non-essential (alanine, aspartic acid, cysteine, glutamic acid, glycine, proline, serine, tyrosine) amino acids are found in milk in a balanced manner (5, 23, 33, 34).

Vitamins and minerals;

Almost all vitamins essential for humans are found in milk. Vitamins A, D, E and K are found as associated with milk fat. While carotenoids give milk fat the yellowish colour, riboflavin is responsible for the fluorescent colour. Fat soluble vitamin content also goes down as the amount of fat milk decreases. Vitamins D and K are found very little in non-enriched milk (5, 26). Milk contains water soluble vitamins as well. It is considered as a good source for folate due to its folate-binding protein and whey content, which increase the absorption. However, despite its high fat content, heat treatment that is applied with or without control can diminish the vitamin content of milk. In a research conducted in Turkey about unpackaged milk, vitamin value is found to be lower than expected. It is determined that boiling for 10 minutes, results in losses of 60, 25, 12, 21 and 32 percent in amounts of thiamine, riboflavin, niacin, Vitamin B12 and folic acid, respectively, and these losses go even higher in 15 minutes of boiling (66, 34, 12, 28, 50 percent), respectively (35). As a results of this study, it is stressed that boiling done at home must be limited to five minutes in order to minimize the vitamin loss, and also this duration might not be sufficient to destroy certain microorganisms that may cause diseases, which are found especially in milk that is sold unpackaged. Therefore, as related institutions warn, it is required to be remembered at all times that unpackaged food, especially milk that is sold in an uncontrolled manner, must never be purchased and consumed, in any circumstances.

Milk is a good source of minerals such as calcium, phosphorus, magnesium, potassium and zinc (31). However, it cannot be highly beneficial for childhood iron requirement, having a low iron content and low iron bioavailability. Mineral content of milk can be affected by various reasons such as physiological status and lactation status of the animal, environmental and genetic factors as well as some processes applied to the milk (5, 26).

Nutritional values in 100 grams of milk and dairy products are given below at Table 2.1 (36).

Table 2.1. Nutritional Values in 100 Grams of Milk and Dairy Products

Foods	Water g	Energy Kcal	Protein g	Fat g	Carbohydrate g	Calcium Mg
Milk	87.9	61	3.3	3.3	4.7	119
Yogurt	88	62	3	3.4	4.9	111
Cheese	58.8	23.5	15.4	18.2	0.8	437
Kashar cheese	35	404	27	31.7	1.4	700
Butter	15.9	717	0.9	81.1	0.1	24
Ice cream	63.2	193	4.5	10.6	20.8	148

2.2.4.3. Health effects of milk and dairy products

Apart from the positive effects such as bone and tooth formation, development and sustained health, support for growth and development, elimination of stomach illnesses by regulating digestive system, skin and eye health, nerve, heart and muscle cells and immune functions; milk and dairy products are also known to prevent risk of malnutrition, hypertension, obesity, osteoporosis and cancer development (3, 32, 37).

Nutrition is of great importance for bone health. Essential food items for bone density are calcium, phosphorus and vitamin D and their source is milk and dairy products. There is a positive correlation between calcium intake and bone mineral density. It prevents osteoclasia and tooth decay. Osteoporosis might develop due to weakening of bone density and depletion of calcium deposits(3, 30, 38).

Milk and dairy consumption as a nutritional behaviour has a positive effect on blood pressure. According to the research done, it is reported that the correlation between blood pressure / hypertension incidence and dairy products is due to the calcium and potassium found in milk. Reduction in calcium intake results in a higher

arterial blood pressure. By increasing intake of these minerals, blood pressure can be lowered. 3-4 portions of daily consumption of dairy products is suggested for ensuring optimal blood pressure and health(3, 30, 38).

2.2.4.4. Daily intake of milk

Amount of milk that is suggested to be consumed by each individual varies according to the age, sex and physiological status (growth and development period, pregnancy, breastfeeding, old age) (27). Following amounts for milk and dairy consumption are suggested in various sources:

In USDA FoodPyramid: 2-3 portions daily (200-400 ml) Nutritional Guide published by National Council of Milk and Dairy Products: 2-4 portions (400-800 ml). Nutritional Guide Specific for Turkey: 2 portions for adults, 3-4 portions (600-800 ml) for children, adolescents, pregnant and breastfeeding women, and post-menopausal women (27, 28).

2.2.4.5. Milk consumption amounts in Turkey and around the world

In the year 2011, where world population is predicted to be 7 billion, milk consumption per capita is 107,3 kg. This number goes up to 120-300 kg in developed countries, while staying under 70kg in developing countries(39).

While milk consumption is low in Asia and Africa, it is higher in Europe and Oceania, especially in Northern European countries such as Ireland, Estonia, Finland, United Kingdom, Iceland. Annual milk consumption per capita is above 100 kg in these countries. Moreover, average consumption of butter and cheese is higher in European Union and Oceania, especially in Western European countries such as France, Luxembourg, Germany, Austria, Czech Republic, Switzerland than in Colombia, Brazil and South Africa. In these countries, annual per capita consumption of butter is above 4 kg while this number is higher than 20 kg for cheese(15, 35).

Clear data about milk and dairy consumption cannot be found in Turkey. Therefore, amount of annual consumption of milk and other dairy products are calculated as predictions. It is predicted that in Turkey, annual per capita consumption of milk is calculated 33,1 kg. One of the widely consumed dairy products in Turkey is cheese. As of 2012, it is predicted that annual per capita consumption of cheese is 14,7 kg. Yoghurt, which has an important place in our culture, is the most processed dairy

product after milk. By a calculation done in a similar fashion to milk and cheese consumption numbers, it is predicted that annual per capita consumption of yoghurt in 28 kg as of 2012 (39).

2.3. Milk and Dairy Products Consumption Habits of University Students

Youth period is the period that encompasses the transition between childhood and adulthood. Young people (15-24 years) forms 16,5% of Turkish population (77 965 904). Students who being their university education are within this age group (40).

University period, during which is an adequate and balanced diet become more important due to changing life conditions such as the increase in dietary needs, being away from family, changing economic conditions; turns eating habits into an action that is done solely for the purpose of feeling full. Besides being essential for life, milk and dairy products becomes a risky issue in university students due to changing habits (16, 41, 42, 43, 44).

In a research done amongst students of SüleymanDemirel University; it is reported that those who like to drink milk forms 69,7%, while those who consume milk regularly makes up 34,2%. In a research done in Erciyes University, it is determined that 80% of students have a habit of regular milk consumption. In another research conducted about milk consumption habits of students from YüzüncüYılUniversity, it is reported that while 77,4% of students like to drink milk, %94,9 does not consume milk regularly. As a result of the research, it has been found that consumption milk and dairy products amongst university students is at a medium level. To deduce a general result from these research; it can be argued that students consume more milk and dairy products during middle school and high school years, this amount decreases due to university life, it affects the physical and mental situation of students and plays a role in chronic diseases that are likely to appear in later ages (16, 41, 42, 43, 44). Therefore, it is extremely crucial to determine the nutritional knowledge and habits of university students as well as to come up with suitable suggestions according to the circumstances.

2.4. Methods Used to Determine Nutritional Status

Methods used when determining nutritional status are; detection of food intake, laboratory tests, clinical symptoms and medical history, anthropometric methods and

psychosocial data. Preferred and applied methods for this research are anthropometric measurements and detection of food intake (33, 45).

2.4.1. Detection of food intake

An appropriate querying done for detection of the amount and type of food consumed by the individual can determine these values by +/- 10 accuracy, by keeping records and evaluating them. Some methods used are; 24 -hour recall, food record), diet history, observation of food intake and food frequency/food propensity. Food frequency method is used in this research(33, 45).

2.4.1.1. Food frequency/food propensity

This method determines the consumption frequency and, if needed, amount daily, weekly and monthly. The questionnaire used can be divided into sections according to the target, such as using one only for milk and dairy consumption. This method is used in order to determine the variations in nutritional pattern of the individual. Although this is a reliable method when determining the correlation between the diet and illness, its limiting feature is the fact that the amounts are detected in a coarse manner(33, 45).

2.4.2. Anthropometric measurements

Anthropometric measurements are used in detection of nutritional status due to them being indicators of protein and fat deposits and that growth and body composition can be determined by using them. They are simple, harmless, cheap, easy to apply and objective. Methods frequently preferred in anthropometric measurements are; body weight and height (ideal body weight, weight loss ratio, body mass index, detection of height from arm span etc.), detection of body fat (measurement of skinfold thickness, mid-upper arm fat area, detection of waist and hip circumference, detection of body composition by laboratory methods), detection of fat-free body mass (mid-upper arm circumference, mid-upper arm muscle area, mid-upper arm muscle circumference, skinfold thickness). In this research, BMI is selected amongst body weight and height methods, while waist-to-hip ratio is selected as a method for detection of body fat. Body mass index is used both for evaluation of obesity and protein-energy malnutrition

(PEM), while waist-to-hip ratio is used as an indicator of risk for android obesity and chronic diseases associated with it (33, 46, 47, 48, 49).

2.4.1.2. Body mass index (BMI)

Body mass index (BMI), which is calculated by dividing body weight in kg by body height squared (m^2), is the simplest method used to obtain data about body composition of individuals, regardless of gender ($BMI = \text{Body weight (kg)} / \text{Height (m}^2\text{)}$) (34, 50).

However, since it does not pinpoint the fat ratio in the body, BMI is not appropriate to use as the only measurement for athletes and individuals with high muscle mass (33, 48).

Below is the table for classification according to BMI (75).

Table 2.2. Classification according to Body Mass Index (BMI)

BMI Classification (kg/m ²)	BMI
Underweight	<18.5
Normal weight	18.5-24.9
Overweight	25-29.9
Obesity Step 1	30-34.9
Obesity Step 2	35-39.9
Morbid Obesity Step 3	>40

2.4.1.3. Waist-to-hip ratio

Waist-to-hip ratio is a measurement method used to evaluate the fat deposition in the body and disease risk associated with it. Waist circumference is measure from the lower end of the lowest rib to the middle of upper end on iliac, while hip measurement is done from the widest point of the hip. Waist-to-hip ratio, which gives insight on the type of obesity such as android-type or gynaecoid-type, is calculated by dividing the waist circumference (cm) by hip circumference (cm) (33, 50, 51).

While in males, a waist circumference above 94 cm is considered a health risk and above 102 cm a high risk, in females, these numbers are above 80 cm for risk and

above 88 cm for high risk. Apart from that, a waist-to-hip ratio not higher than 1,0 and 0,8 is suggested for males and females, respectively (33, 50, 51).

Table 2.3. Classification According to Waist Circumference Measurement

	Risk	High risk
Male	≥ 94 cm	≥ 102 cm
Female	≥ 80 cm	≥ 88 cm

(WHO 2011).

2.5. Calcium

Calcium, which can be taken externally from foods, is found in human body, 99% of which is found within the bones and teeth (in the form of phosphor and calcium salts) and the rest distributed amongst the soft tissue and body fluids (intra-cellular) (36).

Calcium that is found within the crystalline structure called trabeculae in the extremities of long bones, acts to fulfil the increasing need for calcium during growth, development, pregnancy and breastfeeding periods. While between 1000 to 2000 grams of calcium is found in the body of an adult, this amount is 30 grams in a new-born infant(11, 27, 36, 52).

2.5.1. Functions of calcium

1. Maintaining the bone and dental health,
2. Coagulation of blood by stimulating the release of thromboplastin from ionized calcium blood platelets,
3. Release of neurotransmitters from synapses and transfer of ions through the membranes of cell organelles,
4. Release of intracellular and extracellular enzymes and the functioning of protein hormones,
5. Proper functioning of myocardium by maintaining the balance between calcium, sodium, potassium and magnesium ions (11, 27, 36).

2.5.2. Health effects of calcium

Bones have a demand for calcium and vitamin D during childhood and adulthood. Due to the decreasing amount of calcium in bones after the age of 30, it is crucial to replace the lost calcium by food intake and doing physical activity. While rickets, osteomalacia and osteoporosis appear as a result of decrease in mineral content of bones, Rickets and Osteomalacia is associated more with vitamin D deficiency. Osteoporosis is a bone disease seen especially in adult females, appearing due to factors such as irregular exercise and insufficient calcium and vitamin D intake during childhood and youth(27, 28, 52, 53).

It is also revealed by research that calcium has effects on rectal, prostate and colon cancers, cardiovascular diseases, kidney stones, hypertension and weight loss (52).

2.5.3. Calcium requirement

Daily required amount of calcium according to age is presented in the table below (36).

Table 2.4. Daily Requirement of Calcium

<i>Age</i>	<i>Amount</i>
<i>0-6 years</i>	<i>210 mg</i>
<i>7-12 years</i>	<i>270 mg</i>
<i>1-3 years</i>	<i>500 mg</i>
<i>4-8 years</i>	<i>800 mg</i>
<i>9-18 years</i>	<i>1300 mg</i>
<i>19-50 years</i>	<i>1000 mg</i>
<i>51 years and above</i>	<i>1200 mg</i>

Recent studies informed that a calcium intake of above 1200 mg has no effect on reduction of bone fractures and the lower limit of calcium requirement for adults is 741 mgs (36).

2.5.4. Calcium-containing foods

Milk and dairy products are the best source. Other food items that contain calcium are; molasses, sesame, hazelnut, green-leaved vegetables, legumes, eggs, lemon and orange (52).

2.6. What is Obesity

Derived from “obuses” in Latin, which means well-fed, obesity is a chronic disease characterized by an increase in body fat mass with respect to the fat-free body mass, an important health issue that causes various health defects and deaths by affecting all organs and systems of the body, especially the cardiovascular and endocrine system.

Obesity is accepted as one of 10 riskiest diseases by World Health Organisation (WHO)(5, 19, 54, 55). Obesity, which is an abnormal or extreme fat deposition of health threatening scale that appears when the received energy in the body is more than consumed energy in the body, is a multi-factorial disease on which environmental and genetic factors are influential and a major public health issue due to its social and psychological aspects (21, 24, 49).

2.6.1. Causes of obesity

The increase in obesity around the world cannot be solely explained by the changes in genetic structure. It is accepted that environmental factors also play a role in formation of obesity. A sedentary lifestyle and foods which have a high energy content and low nutritional value, are precursors for obesity (55).

Causes of obesity can be grouped as follows:

- ✓ Demographic factors (Age, gender)
- ✓ Genetic factors (Ghrelin, peptide YY3- 36, insulin, passage of obesity in nuclear families...)
- ✓ Intra-uterine effects (Nutrition of the mother during and before pregnancy, low birth weight, high birth weight...)
- ✓ Environmental factors (Socio-economic level, friends, media...)
- ✓ Behavioural factors (Eating habits, physical activity)

- ✓ Psychological factors (Loss of appetite, overeating, mental retardation, reaction to psychological problems) (20, 21, 24).

2.6.2. Prevalence of obesity

Prevalence of obesity is increasing all around the world. World Health Organization (WHO) reports that prevalence of obesity reached 300 million by a 50% increase between 1995 and 2000(5, 56, 57). Organization reports obesity as the greatest public health issue and reported that by the year 2008, more than 200 million males and 300 million females are obese (58). As a result of research done, it can be argued that prevalence of obesity increased around 41% between 1980 and 2013. While the country with highest obesity is USA, increase in prevalence is higher in Turkey than other European countries. Obesity in adults and children has become a concerning health issue in last 20 years (24, 59). According to the 2010 data from Turkish Nutrition and Health Research (TBSA), frequency of obesity in Turkey is 20,5% for males and 41,0% for females. Ratio is 34,6% for overweight individuals, 64,9% for overweight and obese combined and 2,9% for morbidly obese (60).

2.6.3. Obesity diagnosis and treatment

Criteria used in obesity diagnosis are directed to the detection of body weight. Although various methods such a skinfold thickness, laboratory tests, waist circumference and waist-to-hip ratio, bioelectric impedance exist; a simple observation, body mass index (BMI) and waist circumference measurement are usually sufficient for obesity diagnosis (56, 58). These two methods are used in this research.

The aim of obesity treatment is to prevent weight gain and get other disease risk factors that might appear due to weight gain, under control. Methods used in obesity treatment are as follows:

- ✓ Medical Diet Treatment
- ✓ Exercise Treatment
- ✓ Behavioural Treatment
- ✓ Pharmacological Treatment
- ✓ Surgical Treatment (24, 49, 58).

2.7. The Relationship Between Obesity and Calcium

In a healthy diet, as for all food items, milk and dairy products are of great importance. However, many negative results appear due to inadequate and unbalanced nutrition. These results can be listed as; disruptions in growth, development and functioning of the body, worsening course of diseases, decrease in physical strength and efficiency, weak immune system, extended duration of treatment, bloated feeling, tiredness, loss of appetite, loss of willpower, frequent headaches, bending in waist and shoulders, mental retardation and imbalance in body weight. Unhealthy nutrition is effective on the body weight and it is stated that making healthy food choices is important for a healthy body weight. Related to this, fast-food, eating fast and ease of access to food are influential on the formation of obesity(49, 56, 59, 67, 62).

In treatment and reduction of prevalence of obesity, which has become the most significant health issue of today, micro and macro foods play a great role. Calcium is one of these foods whose effects of adipose tissue are admitted in various research done in the course a long time span of 10 years(19, 22).

It is claimed that calcium has two different effect mechanisms on BMI due to body weight(63, 64, 65). First of these is the fact that calcium turns into nonsoluble soaps by bonding with fatty acids in small intestine and cannot be absorbed, therefore increasing the fecal fat discharge in the form of calcium salts of fatty acids (19, 22, 23, 66, 67, 68, 69, 70). This mechanism was first put forward by research done by Barr et al. In the research, the result achieved was that 2g calcium supplement containing calcium carbonate increases fecal fat discharge by 6,8 to 7,4% and helps weight loss occur (71). Second mechanism is about the fact that low calcium intake increases the triglyceride deposit in adipose tissue while high intake increases lipid oxidation. It is claimed that dietary calcium plays a role in stimulation of lipolysis and inhibition of lipogenesis (66) and increase in intracellular calcium level leads to the stimulation of lipogenesis and prevention of lipolysis. Intracellular Ca^{++} (calcium) is thought to be playing a regulatory role in regulation of adipocyte lipid metabolism and triglyceride deposits (67, 72).

Calcium, of which 50% is taken by diet from dairy products, is known to play a role in stimulation of Ca^{++} lipolysis and inhibition of lipogenesis. Low calcium diet boosts synthesis of calcitriol (1,25(OH)₂D₃). This stimulates passage of calcium to the

cells and decreases thermogenesis. Increased intracellular Ca^{++} prevents lipolysis and causes an increase in fat tissue by stimulating lipogenic gene expression and lipogenesis. In a high calcium diet, while calcitriol is suppressed, intracellular Ca^{++} concentration in adipose tissue declines and this causes a decrease in fatty acid synthesis and increase in lipolytic activity. This process results in antiobesity (19, 22, 23, 31, 33, 37, 70, 71).

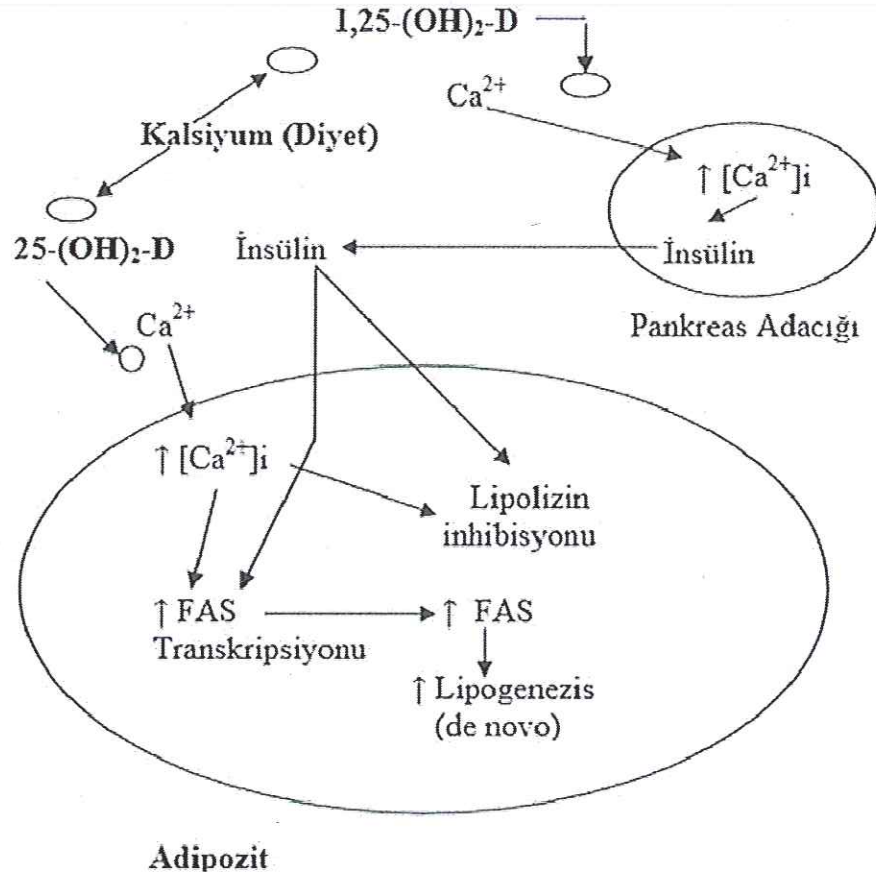


Figure 2.6.1. Modulation of adiposity by 1,25(OH)₂D₃ and dietary calcium (73)

Apart from these mechanisms, some clinical research showed that calcium provided by a high calcium diet is more effective than calcium taken as a supplement. Other components of dairy products are also thought to play a role on weight regulation of the body. Certain bioactive components are found in dairy products that are independent from calcium or acting in a synergy with calcium that ensures lipogenesis, lipolysis, lipid oxidation and/or weight loss. Amongst those, enzyme (ACE) found in whey protein, and angiotensin, which is important for converting inhibitory activities might be associated with lipid metabolism in adipocytes. While angiotensin II regulates fatty acid synthesis expression both in mice and hypertensive patients, ACE inhibition provides weight loss. Since autocrine renin-angiotensin system is found in adipose

tissue, anti-obesity effects of dairy products can be defended due to ACE inhibitor extracted from whey (71).

3. MATERIALS and METHODS

3.1. Type of Research

This research is of definitive type.

3.2. Universe and Sample of Research

Research universe consists of Yeditepe University Graduate School of Health Sciences, Faculty of Engineering and Architecture and Faculty of Fine Arts between the dates of 15 July – 15 August when application of the research was planned. Initially, 200 people studying in 3rd and 4th years of Nursing, Nutrition and Dietetics, Graphic Design and Architecture were included in the sample. However, since number of male students in healthrelated departments negatively affects the comparison of anthropometric measurements, they were left outside the study by being excluded from the statistical segment of the research. The research was conducted by female students. Departments of Nursing and Nutrition were not included in the draw due to their education related to the research field. Other two departments were determined by a draw.

3.3. Inclusion and Exclusion Criteria

Inclusion Criteria

- Verbal and written approval of the willingness to be included in the research,
- To be a 3rd or 4th year student of one of Nursing, Nutrition and Dietetics, Graphic Design and Architecture departments of Yeditepe University as of 2016-2017 academic year.

Exclusion Criteria

- Not giving verbal consent to be included in the research,
- To be out of the designated research group,
- Answering the questionnaire incompletely and conditional questions inconsistently.

3.4. Data Collection Tools

Data for the research was collected using General Information Form and Food Frequency Form (FFQ), prepared by the researcher. General Information Form was prepared by examining related literature by the researchers. The form consists of 27

questions regarding socio-demographic features and dairy consumption. Food Frequency Form (FFQ) consists of a total of eight sections; milk and dairy products, meat and meat products, legumes and oily seeds, bread and other seeds, fruits and vegetables, fats, sugar and desserts and beverages. Daily, weekly and monthly consumption frequencies and, if needed, amounts of foods or food groups are determined. Form can be prepared in different forms according to the target (33, 34, 44, 45). Section about milk and dairy products of the form was used in this research.

BMI and waist-to-hip ratios of participants were calculated by measuring their height (tape measure), weight (Fakir Hercules Body Analysis Scale) and waist and hip circumferences (tape measure).

3.5. Evaluation of Data

The data was first grouped; then necessary coding was done, during the evaluation.

After the data required were collected by using data collection forms on the determined sample group, SPSS 20.0 (Statistical Package for the Social Sciences) statistics package program was used in digital medium. As definitive statistics, percentage distribution was used for categorical data and average±standard deviation was used for continuous numerical data. Chi-square test was used for analysis of categorical data. For analysis of continuous data; according to the group count, normality analysis was used for comparisons with 2 groups while T test was used for independent groups according to the results. $p < 0.05$ was accepted as statistically meaningful.

3.6. Ethical Aspect of the Research

- Approval of the institution was taken.
- Approval of ethical board was taken.
- Voluntary participation of individuals was deemed as the principle, their permissions were taken by explaining them the volunteering form and they were told that they can quit the research at any time without citing a reason.

3.7. Limitations of the Research

Results obtained from the research are limited by individuals that study in Yeditepe University Nursing, Nutrition and Dietetics, Architecture and Graphic Design departments and that volunteer to participate in the research. That fact that the results of this research cannot be generalized for entirety of university students in the country, is the limiting factor of the research.

3.8. Research Questions

1. What is the frequency of milk and dairy consumption amongst university students?
2. Is frequency of milk and dairy consumption higher amongst university student who study nutrition?
3. Is there a correlation between inadequate or excessive milk and dairy consumption and high or normal BMI and high or normal waist-to-hip ratio?

3.9. Cooperation with People and Institutions for Conducting the Research

This research will be conducted in cooperation with Yeditepe University Departments of Nursing, Nutrition and Dietetics, Architecture and Graphic Design.

4. RESULTS

Table 4.1. Distribution of Participants According to Socio-Demographic Properties

Socio-demographic Features	Min.-Max.	Avg±Std.dev
Age	22-24	22,34 ± 0,47
Sex n%		
Female	140	100
Department n%		
Nutrition and Dietetics	48	34,3
Nursing	47	33,6
Graphic Design	13	9,3
Architecture	32	22,9
Department whether related to Health or not n %		
Health Departments	95	67,9
Non-health Departments	45	32,1
Year n %		
3rdYear	60	42,9
4thYear	80	57,1
Family Income		
Income higher than Expenses	15	10,7
Income equal to Expenses	95	67,8
Income less than Expenses	30	21,5
Accommodation n %		
With Family	83	59,3
Separate from Family	41	29,2
Dormitory	16	11,5
Nutrition Education n %		
Yes	97	69,3
No	43	30,7
If yes, where was this education taken? n %		
School Education	95	97,9
Conferences and Conventions	2	2,1

When the data given in Table 4.1 is examined, it is found that ages of participants are between 21 and 24 and average age is $22,34 \pm 0,47$ years. Female students make up 100% of the study. Distribution according the department of study is as such: 34,3% for nutrition and dietetics, 33,6% for nursing, 22,9% for architecture and 9,3% for graphic design. 67,9% (95 people) of students are from a health related department while 32,1% (45 people) are from non-health departments. 3rd year students make up 42,9% of participants while 4th year students make up 57,1%. More than half (67,8%) of the participants have their income equal to their expenses. While 59% of participants live with their families, 41% live away from them. Amongst those who are trained in nutrition (69,3%), almost all (97,9%) are those who have taken this education at school.

Table 4.2. Distribution of Participants According to BMI Values

BMI groups	n	%
Underweight(<18.5 kg/m ²)	26	18,6
Normal weight(18.5-24.9 kg/m ²)	95	67,9
Overweight(25-29.9 kg/m ²)	19	13,6
Total	140	100,0

Data given in Table 4.2 gives the results that 18,6% (26 people) of individuals are underweight, 67,9% (95 people) are normal weight and 13,6% (19 people) are overweight.

Table 4.3. Distribution of Participants according to Anthropomorphic Features

Measurement	n	Min	Max	Avg	Std.dev
Height (cm)	140	140,00	180,00	164,93	5,89
Weight (kg)	140	43,00	80,00	57,26	7,44
BMI (kg/m ²)	140	16,60	28,90	21,07	2,74
Waist circum. (cm)	140	55,00	100,00	70,25	8,95
Hipcircum. (cm)	140	80,00	120,00	95,85	7,32
Waist-to-hip ratio(cm)	140	0,58	0,93	0,73	0,074

Data given in Table 4.3 gives the results that heights of participants are between 140-180 cm and is $164,93 \pm 5,89$ on average. Body weights of participants vary between 43 to 80 kg and the average is $57,26 \pm 7,44$ kg. BMI values are between 16,60-28,90 (kg/m²) and the average BMI is $21,07 \pm 2,74$ (kg/m²). Waist circumferences are between 55 to 100 cm and on average the value is $70,25 \pm 8,95$ cm. Hip circumference is between 80 to 120cm and the average is $95,85 \pm 7,32$ cm. Finally, waist-to-hip ratios are between 0,58 and 0,93, and their average is $0,73 \pm 0,074$ cm.

Table 4.4. Min. and Max. Values of Anthropometric Measurements of Participants According to Their Departments

	Measurement	n	Min.	Max.	Avg.	Std.dev
Health-related departments	Height (cm)	95	151,00	179,00	165,49	5,22
	Weight (kg)	95	43,00	80,00	56,55	7,14
	BMI (kg/m ²)	95	16,60	28,90	20,64	2,43
	Waist circum. (cm)	95	55,00	100,00	67,83	7,10
	Hip circum. (cm)	95	80,00	120,00	95,01	7,55
	Waist-to-hip ratio(cm)	95	0,58	0,87	0,71	0,06
Non-health departments	Height (cm)	45	140,00	180,00	163,75	7,01
	Weight (kg)	45	46,00	73,00	58,75	7,90
	BMI (kg/m ²)	45	17,30	28,10	21,98	3,14
	Waist circum. (cm)	45	58,00	90,00	75,37	10,28
	Hip circum. (cm)	45	80,00	112,00	97,63	6,55
	Waist-to-hip ratio(cm)	45	0,65	0,93	0,76	0,82

On Table 4.4; distribution of anthropometric measurements of participants according to the classification made by departments being health-related or not. When compared by height, weight, BMI, waist circumference, hip circumference and waist-to-hip ratio, it can be seen that all measurements except the height are lower for healthrelated departments, while higher for non-health departments.

Table 4.5. Comparison of Anthropometric Measurements of Participants According to Their Departments

Measurement	Health-related departments	Non-health departments
	n (%)	n (%)
BMI		
<25 (kg/m ²)	90 (94,7)	31 (68,8)
>25 (kg/m ²)	5 (5,3)	14 (31,2)
p:0.002		
Waist circumference (cm)		
Normal (<80 cm)	89 (93,7)	26 (57,8)
Risky(≥ 80 cm + ≥ 88 cm)	6 (6,3)	19 (42,2)
p:0.004		
Waist-to-hip ratio (cm)		
Normal (<0.85 cm)	85 (89,5)	25 (55,6)
Risky (>0.85 cm)	10 (10,5)	20 (44,4)
p:0.001		

When Table 4.5 is examined, it can be seen that there is significant difference (p:0.002; p<0.05) in BMI grouping according to departments. While most students with BMI<25kg/m² study in health-related departments (94,7%), most students with higher BMI than 25kg/m² study in non-health departments.

A significant difference is also spotted between departments and waist circumference groupings (p:0.004; p<0.05). While people with normal waist circumference is higher than risky ones in both groups, it can be seen that number and ratio of participants with normal waist circumference are higher (93,7%, 89 people) amongst those who study in a health-related department.

Significant difference is also spotted regarding departments and waist-to-hip ratio groupings ($p:0.001$; $p<0.05$). 44,4% (20 people) of participants with a risky waist-to-hip ratio consists of non-health related departments. More than half (89,5%) of participants with a normal waist-to-hip ratio are from health-related departments. Number of participants with a normal waist-to-hip ratio is higher in both groups.

Table 4.6. Distribution of Participants According to Their Consumption of Milk and Dairy Products

Question/Answer	n	%
Milk drinking habit		
Yes	88	62,9
No	52	37,1
If yes, when did you form the habit		
Infancy	33	37,5
Childhood	40	45,5
Primary School	6	6,8
High School	9	10,2
Do you consume more milk now than the period you formed the habit		
Same	31	24,0
More	13	10,1
Less	85	65,9
If you don't have the habit, the reason is		
I have digestive issues	10	19,2
Makes me nauseous	17	32,7
Don't like the taste	7	13,5
I am disgusted by it	18	34,6
Do you have the habit of consuming dairy products?		
Yes	121	86,4
No	19	13,6
If you don't have the habit, the reason is		
I have digestive issues	6	31,6
Makes me nauseous	3	15,8
Don't like the taste	9	47,4
I am disgusted by it	1	5,3
Reason for consuming milk and dairy products		
It makes me stuffed	13	10,7
As a habit	24	19,8
Fulfils the calcium requirement of the body	84	69,4

As seen in Table 4.6, 62,9% of participant have a milk habit and 45,5% of them gained it during childhood. Disgust is the reason for most (34,6%) who don't consume milk. 86,5% of participants consume milk while those who don't consume report that they don't like the taste (47,4%) or have digestive issues (31,6%). Majority (69,4%) of participants is observed to consume milk and dairy products since it fulfils the calcium requirement of the body.

Table 4.7. Comparison of Milk and Dairy Products Consumption Habits of Participants According to Their Department of Study

Question/Answer	Health Departments	Non-health Departments
	n (%)	n (%)
Milk drinking habit		
Yes	67 (76,1)	21 (23,9)
No	28 (53,8)	24 (46,2)
p:0.006		
If you don't have the habit, the reason is		
I have digestive issues	2 (20,0)	8 (80,0)
Makes me nauseous	2 (28,6)	5 (71,4)
Don't like the taste	11 (64,7)	6 (35,3)
I am disgusted by it	13 (72,2)	5 (27,8)
p:0.022		
Dairy products consuming habit		
Yes	90 (74,4)	31 (68,9)
No	5 (26,3)	14 (31,1)
p:0.001		
If no, the reason is		
I have digestive issues	2 (33,3)	4 (66,7)
Don't like the taste	3 (33,3)	6 (66,7)
Makes me nauseous	0	3 (100)
I am disgusted by it	0	1 (100)
p:0.613		
Reason for milk and dairy consumption		
It makes me stuffed	5 (5,6)	8 (25,8)
As a habit	19 (21,1)	5 (16,1)
Fulfils the calcium need of the body	66 (73,3)	18 (58,1)
p:0.007		

When data on Table 4.7 is examined; it can be seen that significant difference between milk consumption habits and departments of participants ($p:0.006$; $p<0.05$). Departments with highest consumption habits are those related to health (76,1%).

Significant difference is found between reason for not consuming milk and department of study ($p:0.022$; $p<0.05$).

Significant difference between dairy product consumption habits and departments of participants is found ($p:0.001$; $p<0.05$). Departments with highest consumption habits are those related to health (74,4%, 90 people). This percentage drops to 68,9% (31 people) in non-health-related departments.

No significant difference is found between reason for consuming milk and department of study ($p:0.613$).

Significant difference is found between reason for milk and dairy consumption and department of study ($p:0.007$; $p<0.05$). While the answer "Fulfils the calcium need of the body" is higher for both groups of departments, health-related departments form the majority (%73,3). No significant difference is found between health (5 people) and non-health (8 people) departments amongst participant who gave the answer "It makes me stuffed".

Table 4.8. Comparison of Participants According to Their Levels of Knowledge of Daily Needed Amount of Calcium Intake for 19-55 Years of Age

Amount	Health Departments	Non-health Departments
	n (%)	n (%)
<1000 mg	4 (80)	1 (20)
1000 mg	2 (100)	0
>1000 mg	3 (100)	0
p:0.565		

When Table 4,8 is examined, no significant difference is found between amongst those who have the knowledge of daily required calcium intake reason for consuming milk and department of study ($p:0.565$; $p<0.05$). 100% of those gave the answer of 1000 mg for daily required calcium intake are participant from health-related departments.

Table 4.9. Comparison of Milk and Dairy Products Consumption Habits of Participant According to Whether Nutritional Education is Taken or Not

Habit		Nutritional Education	
		Yes	No
		n (%)	n (%)
Dairy products	Yes	90 (74,4)	31 (25,6)
	No	7 (36,8)	12 (63,2)
p:0.001			
Milk	Yes	67 (76,1)	21 (27,9)
	No	30 (57,7)	22 (42,3)
p:0.022			

As seen on Table 4.9, significant difference is found in milk consumption habits according to education taken in nutrition (p:0.022; p<0.005). It is found that milk drinking habit is higher for those who have received this education (69,1%).

Significant difference is found in consumption habits for dairy products according to education taken in nutrition (p:0.001; p<0.005). It is found that almost all participants (92,8%) who have received this education consume dairy products.

Table 4.10. Distribution of Participants According to Their Consumption Frequency of Milk and Dairy Products

		n	%
Full-fat milk	Every meal	6	6,8
	Everyday	65	73,9
	Once in a week	9	10,2
	2-3 times a week	5	5,7
	3-4 times a week	2	2,3
	Once a month or less	1	1,1
Half-fat milk	Every meal	2	4,0
	Everyday	32	64,0
	Once a week	4	8,0
	2-3 times a week	3	6,0
	3-4 times a week	2	4,0
	5-6 times a week	3	6,0
	2-3 times a month	2	4,0
Once a month or less	2	4,0	
Non-fat milk	Everyday	8	28,6
	Once a week	5	17,9
	2-3 times a week	4	14,3
	3-4 times a week	1	3,6
	5-6 times a week	1	3,6
	2-3 times a month	3	10,7
Once a month or less	6	21,4	
Full-fat yoghurt	Every meal	11	8,7
	Everyday	86	67,7
	Once a week	3	2,4
	2-3 times a week	14	11,0
	3-4 times a week	4	3,1
	5-6 times a week	6	4,7
	2-3 times a month	2	1,6
	Once a month or less	1	,8

Table 4.10. Distribution of Participants According to Their Consumption Frequency of Milk and Dairy Products (MORE)

		n	%
Half-fat yoghurt	Every meal	4	6,3
	Everyday	40	62,5
	1 time a week	6	9,4
	2-3 times a week	7	10,9
	3-4 times a week	3	4,7
	2-3 times a month	3	4,7
	Once a month or less	1	1,6
	White cheese	Every meal	14
Everyday		98	69,0
Once a week		4	2,8
2-3 times a week		12	8,5
3-4 times a week		7	4,9
5-6 times a week		7	4,9
Kasharcheese		Every meal	3
	Everyday	58	50,0
	Once a week	17	14,7
	2-3 times a week	21	18,1
	3-4 times a week	8	6,9
	5-6 times a week	6	5,2
	2-3 times a month	3	2,6
Ayran	Every meal	2	1,5
	Everyday	66	48,2
	Once a week	17	12,4
	2-3 times a week	27	19,7
	3-4 times a week	14	10,2
	5-6 times a week	3	2,2
	2-3 times a month	4	2,9
	Once a month or less	4	2,9

When examined the consumption frequencies of different dairy products, largest percentages can be seen as follows: Full-fat milk, every day with 73,9%; half-fat milk,

every day with 64,0%; full-fat yoghurt, every day with 28,6%; half-fat yoghurt, every day with 62,5%; white cheese, every day with 69%; kashar cheese, every day with 50% and ayran, every day with 48%.

Table 4.11. Average, Min. and Max Values of Calcium Intake According to the Type of Dairy Products Consumed by Participants

		n	Min	Max	Avg	Std.dev.
Half-fat milk	Every meal	2	240,00	240,00	240,00	,00
	Every day	32	240,00	480,00	322,50	115,81
Non-fat milk	Every meal	0	0,00	0,00	0,00	0,00
	Every day	8	240,00	480,00	360,00	128,8
Full-fat yoghurt	Every meal	11	312,00	312,00	312,00	0,00
	Every day	86	312,00	936,00	351,90	124,76
Half-fat yoghurt	Every meal	4	312,00	312,00	312,00	0,00
	Every day	40	312,00	624,00	358,80	112,82
Half-fat white cheese	Every meal	14	157,50	787,50	202,50	168,37
	Every day	98	157,50	630,00	250,71	121,44
Half-fat kashar cheese	Every meal	3	300,00	900,00	600,00	300,00
	Every day	58	300,00	1200,00	393,10	196,33
Half-fat ayran	Every meal	2	146,00	146,00	146,00	0,00
	Every day	66	146,00	438,00	173,65	62,42

Average, min. and max values of calcium intakes according to the type of dairy products consumed by participants can be seen on Table 4.11. While those who consume half-fat milk, non-fat milk, full-fat yoghurt, half-fat yoghurt, half-fat white cheese and half-fat ayran every day take more calcium; it is seen that those who consume half-fat kashar cheese at every meal take more calcium.

Table 4.12. Distribution of Participants According to Their Consumption of Milk and Dairy Products

Consumption Frequency	Consuming		Non-consuming		Total	
	n	%	n	%	n	%
Full-fat milk	70	50,0	70	50,0	140	100,0
Half-fat milk	42	30,0	98	70,0	140	100,0
Non-fat milk	24	17,1	116	82,9	140	100,0
Full-fat yoghurt	95	67,9	45	32,1	140	100,0
Half-fat yoghurt	50	35,7	90	64,3	140	100,0
White cheese	110	78,6	30	21,4	140	100,0
Kashar Cheese	87	62,1	53	37,9	140	100,0
Ayran	102	72,9	38	27,1	140	100,0

As seen on Table 4.12, consumption values are shown to be as follows; Full-fat milk - 50,0%; half-fat milk - 30,0%; non-fat milk – 17,1% (24 people); full-fat yoghurt - 67,9% (95 people); half-fat yoghurt – 35,7% (50 people); white cheese – 78,6% (110 people), kashar cheese – 62,1% (87 people) and ayran – 72,9%.

Table 4.13. Distribution of Participants According to Their Calcium Intake from Consumption of Milk and Dairy Products (Each Meal – Each Day)

Calcium Amount	n	%	Min.	Max.	Avg.	Std.dev
<600 mg	8	6,6	157,5	555,0	356,25	129,6
600-1000 mg	37	30,6	615,5	1000,0	807,75	201,3
>1000 mg	76	62,8	1009,5	1598,0	1303,75	315,2

Table 4.13 shows minimum, maximum and average values regarding calcium intake according to consumption (each meal - each day) of milk and dairy products by participants. While lowest calcium consumption in <600 mg group is 157,5 mg, highest values is 555,0 mg. Minimum value for calcium consumption in 600-1000 mg group while maximum value is 1000 mg. Finally, lowest value for calcium intake in >1000 mg group is 1009,5 mg while the highest value is 1598,0 mg.

Table 4.14. Comparison of Amount of Calcium Taken from Milk and Dairy Products Consumed Every day and at Every Meal by Participants

Amount	Health-Related Departments	Non Health-Related Departments
	n (%)	n (%)
<600 mg	4 (50)	4 (50)
600-1000 mg	31 (83,8)	6 (16,2)
>1000 mg	55 (72,4)	21 (27,6)
p:0.014		

According to data on Table 4.14, statistical difference is found between two groups of departments and daily calcium intake ($p:0.014$; $p<0.05$). Percentage of those who consume >1000 mg of calcium from daily milk and dairy consumption is higher in both groups but this ratio is even higher in health-related departments (72,4%). It is found that the ratio of those who consume <600 mg of calcium is equal amongst groups (50%, 4 people). It is also found that the ratio of participants in health-related departments that consume 600-1000 mg of calcium is higher (83,8%) than other departments.

Table 4.15. Comparison of Amount of Calcium Taken from Milk and Dairy Products on Each Day and Each Meal According to BMI Values of Participants

		BMI	
		<25 (kg/m ²)	>25(kg/m ²)
	Calcium Amount	n (%)	n (%)
Health-related departments	<600 mg	1 (1)	3 (100)
	600-1000 mg	31 (36)	0
	>1000 mg	55 (63)	0
p=0.001			
Non-health departments	<600 mg	2 (6,9)	2 (100)
	600-1000 mg	6 (20,7)	0
	>1000 mg	21 (72,4)	0
p=0.001			

According to data on Table 4.15, statistical difference is found between BMI values and calcium taken at each day and each meal from milk and dairy products habits in departments (p:0.001; p>0.05). Almost all of participant with BMI <25 kg/m² are those with calcium consumption of >1000 mg while this number is found to be higher for health-related departments (55 people). In both groups, it is seen that participants with BMI >25 kg/m² consume <600 mg of calcium.

According to data on Table 4.15, statistical difference is found between BMI values and calcium taken at each day and each meal from milk and dairy products habits in departments (p:0.001; p>0.05). Almost all of participant with BMI <25 kg/m² are those with calcium consumption of >1000 mg

Table 4.16. Comparison of Amount of Calcium Taken from Milk and Dairy Products on Each Day and Each Meal According to Waist-To-Hip Ratio Values of Participants

		Waist-to-hip ratio	
		No risk	Risk
	Calcium Amount	n (%)	n (%)
Health-related departments	<600 mg	3 (4)	1 (20)
	600-1000 mg	27 (31)	4 (80)
	>1000 mg	55 (65)	0
p:0.001			
Non-health departments	<600 mg	0	4(66,6)
	600-1000 mg	4 (16)	2 (33,3)
	>1000 mg	21 (84)	0
p:0.027			

As seen on Table 4.16, difference is found between daily intake of calcium and waist-to-hip ratio of participants in health-related departments ($p:0.001$; $p>0.05$). More than half (65%) of those outside the risk group is observed to consume >1000 mg of calcium.

Difference is found between daily intake of calcium and waist-to-hip ratio of participants in non-health-related departments ($p:0.001$; $p>0.05$). More than half (84%) of those outside the risk group is observed to consume >1000 mg of calcium.

Most of participants with risky waist-to-hip ratios consists of students from non-health departments and <600 mg calcium consumers.

Table 4.17. Comparison of Milk Consumption Habits of Participants According to Their BMI Measurements

		BMI	
		<25(kg/m ²)	>25(kg/m ²)
	Habit	n (%)	n (%)
Health-related departments	Yes	66 (73,3)	1 (20)
	No	24 (26,7)	4 (80)
p=0.001			
Non-health departments	Yes	20 (65,5)	1 (7)
	No	11 (35,5)	13 (93)
p=0.001			

According to data on Table 4.17, difference is found between BMI values and milk consumption habits in health-related departments (p:0.001; p>0.05). Almost all of participant with BMI <25 kg/m² are those with milk habits (73,3%, 66 people).

Statistical difference is found between BMI values and dairy product habits in non-health-related departments (p:0.001; p<0.05). Almost all of participants with BMI <25 kg/m² are those with milk habits (65,5%, 20 people).

It is seen that almost all participants with BMI >25 kg/m² in both groups are those without a habit for milk consumption.

Table 4.18. Comparison of Dairy Products Consumption Habits of Participants According to Their BMI Measurements

		BMI	
		<25(kg/m ²)	>25(kg/m ²)
Habit		n (%)	n (%)
Health-related departments	Yes	86 (95,6)	4 (80)
	No	4 (4,4)	1 (20)
p=0.129			
Non-health departments	Yes	29 (93,5)	2 (14,3)
	No	2 (6,5)	12 (85,7)
p=0.001			

According to data on Table 4.18, difference is found between BMI values and dairy product habits in health-related departments ($p:0.001$; $p>0.05$). Almost all of participant with BMI $<25 \text{ kg/m}^2$ are those with milk habits (95,6%, 86 people).

Statistical difference is found between BMI values and dairy product habits in non-health-related departments ($p:0.001$; $p<0.05$). Almost all of participants with BMI $<25 \text{ kg/m}^2$ are those with milk habits (93,5%, 29 people).

It is seen that almost all participants with BMI $>25 \text{ kg/m}^2$ in both groups are those without a habit for milk and dairy products.

5. DISCUSSION and CONCLUSION

In this research; milk and dairy consumption habits of university students, difference in level of knowledge about this food group amongst different departments and the relationship between calcium intake and BMI and waist-to-hip ratio were planned to be studied. While the research was limited to 3rd and 4th year students, departments of Nursing, Nutrition and Dietetics, Graphic Design and Architecture were included. Other departments were left out of the research. A total of 140 students, 60 from 3rd year and 80 from 4th year, participated in the research. In this section, results obtained from survey form applied between July and August of 2017. Discussion section of research was handled according to the order in findings section.

Ages of 140 students participated in the research are between and 22 and 24 and the average age is $22,34 \pm 0,47$. Females consist 100% of students. The reason for exclusion of male students is the fact that number of male students in health related departments negatively affects the comparison of anthropometric measurements.

According to the department of study; 34,3% of students were from nutrition and dietetics, 33,6% from nursing, 22,9% from architecture and 9,3% from graphic design. When classified according to department being health-related or not; 67,9% (95 people) were from health-related departments while 32,1% (45 people) were from non-health departments. 59,0% of participants live with their families while 11,5% live in dormitories. 95 of participants answered as having their incomes equal to their expenses.

In Yeditepe University Nutrition and Dietetics Department, there are numerous compulsory courses such as Principles of Nutrition, Food Preparation and Cooking Techniques, Nutritional Biochemistry, Diet Treatment in Diseases; while in Nursing department, Principles of Nutrition takes place in 1st year as a compulsory course. However, there exists no courses related to nutrition in Graphic Design and Architecture departments (74). Students studying in a health-related department make up almost all (97,9%) of participants that take nutritional education in school, while 2,1% claims that they have taken nutritional education during programs such as conferences and seminars.

Heights of students participated in the study vary between are between 140-180 cm and is $164,93 \pm 5,89$ on average. Their body weights vary between 43 kg and 80 kg and the average is $57,26 \pm 7,44$ kg. BMI values are between $16,66 \text{ kg/m}^2$ and

28,90kg/m²; on average 21,07± 2,74 kg/m². More than half (67,9%) of the participants are classified as normal, 18,5% as underweight and 13,6% as overweight, according to the definitions of World Health Organisation. Waist circumferences of participant are change between 55 and 100 cm and the average is 70,25± 8,95 cm. Their hip circumferences are between 80 and 120 cm while the average is 95,85 ± 7,32 cm. Waist-to-hip ratios are between 0,58-0,93 cm and average value for this measurement is 0,73 ± 0,074 cm'. Waist-to-hip ratio distribution must be <0,85 cm according to the classification by WHO (51). Number of participants with normal waist-to-hip ratios is found to be greater than those with a risky waist-to-hip ratio both in health-related and non-health-related departments, while this number is higher for health-related departments. In a study done by Aylaz et al. (2016) in May-June of 2013 on 195 participants working by Public Health Directorate in Eastern Anatolia Region, to determine the factors affecting obesity and its frequency; it is reported that 62,6% of participants are married, 38,5% are between 20 and 35 years old and 42,6% are overweight. As a result of the research; factors such as age, being male, marital status, working hours, existence of diagnosed diseases, number of births, self-definition, time spent by the desk and time spent sitting are found to be important factors affecting obesity frequency (76). Finally, it can be argued that they have normal anthropometric measurements due to health nutrition and health lifestyle. This situation may arise from the awareness caused by their average age, gender and fields of education.

62,9% of students participated in the research have milk drinking habits and 45,5% gained this habit during childhood. Disgust is the reason for most (34,6%) who don't consume milk. 86,5% of participants consume milk while those who don't consume report that they don't like the taste (47,4%) or have digestive issues (31,6%). Significant correlation between milk habits and departments of participants is identified (p:0.006; p<0.05). The group with highest percentage (74,4%, 90 people) of milk drinking habits is identified as health-related departments. For non-health departments this ratio falls to 68,9% (31 people). Study done by Şimşek et al. (2011), reveals that 69,7% of students like to drink milk while 34,2% consume milk regularly. Discomfort with taste and smell is mostly reported as a reason not to like milk. 81.0% of participants reported that milk must be consumed at all ages (16). In a study done by Şahinöz (2017) with 120 university students, 41,7% of students reported that they have a regular milk drinking habit and they gained it between 0 to 6 years of age (42).

According to research done by Hasscini et al. (2017) with students; 41,0% of students consume milk daily while 59% do not (77).

In a study done by Baghionimoghodom et al. (2016) on 385 students between the ages of 20 and 24, 64,0% of students are shown to consume milk daily (78). Studies conducted and our research shows that university students consume milk and dairy products, however, the rates and frequencies of consumption vary.

No significant difference between students participated in our research and daily required calcium intake can be identified. All (100%) participants who answered 1000 mg for required daily intake of calcium are those from healthrelated departments. Amounts of calcium in one portion (200 ml) of milk and dairy products, determined by BEBİS program are 240 mg for milk, 312 mg for yoghurt, 300 mg for kashar cheese, 157,5 mg for white cheese and 146 mg for ayran. However, no meaningful correlation can be found between departments and those who know the amount of calcium in one portion of milk and dairy products due to low number of participant who know this value. Significant difference is found in milk habits according to whether nutritional education is received or not ($p:0.001$; $p<0.005$) and it was observed that more people of those with the mentioned education have a habit of milk drinking (76,1%). Significant difference is also found in dairy products consumption statistics according to the nutritional education received. Almost all (92,8%) of those who received the education are identified as consumers of dairy products. Majority of participants reported that they consume milk and dairy products due to the fact that they fulfil the calcium requirement of the body. In similar studies conducted by Şimşek (2011) and Tarakçı et al. (2003); it is reported that they don't have sufficient knowledge on milk and dairy products consumed by students(16, 44). Another study by Çetinkaya (2010) reveals that students list their milk consumption motivations as following: 46% because it is nutritious, 25,3% due to milk fulfilling their calcium, protein and vitamin requirements. While 65,5% of students reports being aware of nutritional value of milk and dairy products, 24,2% claimed they are not (32). While the lack of significant difference between groups who received nutritional education and those who did not shows the lack of awareness in eating habits; it can be argued that courses taken and department of study affects milk and dairy consumption in a positive manner.

Amongst students participating in the research, %50 consume full-fat milk, 50% consume half-fat milk, 17,1% (24 people) consume non-fat milk, 67,9% consume full fat yoghurt, 35,7% (90 people) consume half-fat yoghurt, 78,6% (110 people) white

cheese, 62,1% (87 people) consume kashar cheese and 72,9% consume ayran. In a different research similar phenomenon is seen as yoghurt, cheese and ayran is found in a high percentage as non-milk dairy products consumed (32). In contrast to these studies, Yılmaz and Özkan (2007) showed that consumption of milk and dairy products is not of adequate value and most consumed drinks are water, tea and coffee. It is identified that %4 of students consume ayran, 22,3% consume yoghurt and %76 consume cheese (1). As a result, it can be claimed that milk, white cheese and yoghurt is preferred and consumed by university students.

Average amount of calcium taken by participants from milk and dairy products were calculated by taking into account the amounts they reported on food frequency form regarding their consumptions for each meal and each day. Average calcium amounts coming from milk and dairy products are classified as <600 mg, between 600-1000 mg and >1000 mg. In group of <600 mg, calcium consumption of participants is minimum 157,5 and maximum 555,0 mg. In the next group of 600 to 1000 mg, minimum consumption is 615,5 mg while maximum is 1000 mg. Finally, in group of >1000 mg, lowest value is 1009,5 mg and highest value is 1598,0 mg. Significant difference is found between daily consumption of calcium and two groups ($p:0.014$; $p<0.05$). Percentage of those who consume >1000 mg of calcium amongst those who consume daily milk and dairy products is high in both groups. However, this number is significantly higher (72,4%) in health-related departments. Ratio of those who consume <600 mg calcium is found to be equal amongst groups (50%, 4 people). Amongst participants in health-related departments, percentage of those who consume calcium between 600-1000 mg is found to be higher (83,8%) than that of other departments. It is a natural result that consumption of >1000 mg calcium in health-related departments is higher than other departments since 76,1% have milk drinking habit and 74,4% have the habit of dairy product consumption.

Significance is found between BMI grouping of participants and amount of calcium taken from milk and dairy products every day and every meal. While most of participants with BMI <25 kg/m² are those who consume >1000 mg of calcium, this number is even higher (55 people) amongst those who study in a health-related department. It is found that in both groups, those with BMI >25 kg/m² consume <600 mg of calcium. Difference is found between daily intake of calcium and waist-to-hip ratio of participants in health-related departments ($p:0.001$; $p>0.05$). More than half (65%) of those outside the risk group is observed to consume >1000 mg of calcium. Difference is

found between daily intake of calcium and waist-to-hip ratio of participants in non-health-related departments ($p:0.001$; $p>0.05$). Most of people with risky waist-to-hip ratios consists of people from non-health departments and <600 mg calcium consumers.

In a study done by Heoney et al. (2002); correlation between calcium and body weight is examined. It is observed that 16,6% of individuals with BMI over 26 kg/m^2 consumes 500 mg of calcium and only 36,6% consumes 1100 mg of calcium. Fat loss of nearly 1 kg and body weight loss of 2,5 to 3 kg is observed in individuals with regular intake of 300 mg calcium. As a result, it is shown that regular calcium intake and 2 portions of consumption of milk and dairy products each day reduces the risk of overweight (79). A 9-year research done by Rosell et al. (2006) to study the relationship between milk and dairy consumption and change in weight of premenopausal women; food frequency and daily food intake is examined in 1987. This is repeated in 1997. While majority of women consume any type of dairy products less than 1 portion a day, more than 1 portion cheese is consumed daily by 74,0% of women. While BMI is found to be significantly higher in women who consume low amounts of milk and dairy products, it is shown that risk of 1 kg of weight gain is lower for those who consume more than 1 portion of milk and dairy products daily (80). In a cross-sectional study done by Azadbakht (2005) in Tehran amongst 827 participants, 357 males and 470 females, aged between 18 and 74; significant correlation is found between high BMI and inadequate consumption of milk and dairy products by individuals (81). Scwingshockl et al. (2016) shows that yoghurt reduces the risk of obesity and alters body weight and waist circumference (82). In a study by Lu L. et al. (2016) where 46 011 children and young were observed for 3 years; it is seen that 38,0% of those who consume low amounts of calcium are obese. It is also seen that a reduction of 0,65% of body fat percentage occurred in those who consume 1 portion of dairy products daily (83). Marques et al. (2005) showed in their research where they studied the relationship between dairy consumption and body mass index, that male and female individuals with adequate milk consumption have lower body mass index (84). Zemel et al. (2005) found that a low energy diet, yoghurt consumption of obese individuals results in fat loss (62). In the research by Jacqmain et al. (2003) where they grouped individuals according to their daily calcium consumptions as A (<600 mg), B (600–1000 mg) and C (> 1000 mg), done by 235 males and 235 female participants between the ages of 20 and 60; a correlation between low calcium intake and high BMI was only found in females (85). Lee et al. (2014) claimed that there is a correlation between high consumption of milk

and dairy products and low prevalence of obesity (86). When our study and others are examined, it can be argued that individuals with anthropometric measurements within normal limits are consuming adequate amounts of calcium.

In our research where we started by asking questions such as “What is the frequency of milk and dairy consumption amongst university students?”, “Is frequency of milk and dairy consumption higher amongst university student who study nutrition?” and “Is there a correlation between inadequate or excessive milk and dairy consumption and high or normal BMI and high or normal waist-to-hip ratio?”; it can be seen that students of Nursing and Nutrition and Dietetics departments knows both the nutritional value of milk and daily required amount of calcium for an adult better than students of Architecture and Graphic Design departments and those who were trained in nutrition consume more milk than those who were not.

BMI and waist-to-hip ratio values of university students who consume 1000 mg or <1000 mg of milk and dairy products are found to be within normal limits. However, our literature review shows that further research is needed to be able to prove the correlation between high consumption of milk and dairy products and normal values of BMI and waist-to-hip ratios.

Since milk and dairy products is not a food group that can be consumed during a certain age group, a decrease in habit should not be seen amongst university students. To ensure that, all departments, regardless of nutritional education taken about milk and dairy products, must be made aware and role of sufficient calcium intake on body control must be stressed.

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APPENDIX 1: Genel Bilgi Formu

Değerlikatılımcı

Aşağıdakişiselözelliklerinizin yanısıra, süt ve sütürünleritüketimalışkanlığı ile ilgilibasorular bulunmaktadır. Sorularieksiksiz olarak yanıtlanmanızsonuçların güvenirliliğiiaçısından son dereceönemlidir. Sorduğumuzsorularaverdiğinizyanıtlargizlitutulupkimseylepaylaşılmayacaktır. Katkı ve işbirliğiniz için şimdidenteseşekkürederiz.

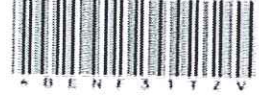
1. Yaşınız:
2. Cinsiyetiniz:
3. Bölümünüz:
4. Kaçincısınıftasınız:
5. Boy uzunluğu (cm):
6. Vücut ağırlığı (kg):
7. BKİ (kg/m²):
8. Bel (cm):
9. Kalça (cm):
10. Bel/kalça oranı:
11. Ailenizingelirdurumu
 - 1) Gelirigiderinden fazla
 - 2) Gelirigideriyleeşit
 - 3) Gelirigiderindenaz
12. Yaşadığınız yer
 - 1) Aile ile birlikte
 - 2) Ailedenayrıyurtta
13. Çalışma durumu
 - 1) Çalışıyor
 - 2) Çalışmıyor
14. Beslenme eğitimi aldınız mı?
 - 3) Evet
 - 4) Hayır
15. Beslenme eğitimininerealdealdınız?
 - 1) Okul eğitimi içinde
 - 2) Konferanspaneller
 - 3) Diğer
16. Sütüçiyormusunuz?
 - 1) Evet
 - 2) Hayır

17. Cevabınız hayır ise tüketmemenedeniniz?
1) Sindirim sorunu yaşıyorum
2) Mide bulantısı yapıyor
3) Tadı ve kokusu rahatsız ediyor
4) Tiksiniyorum
5) Diğer
18. Süt içme alışkanlığınızı hangi dönemde kazandınız?
1) Bebeklikte
2) Çocuklukta
3) Yetişkinlikte
19. Şu anda tükettiğiniz süt miktarı alışkanlık kazandığınız dönemden fazla mı?
1) Aynı
2) Daha az
3) Daha fazla
20. Süt ürünleri tüketiyor musunuz?
1) Evet
2) Hayır
21. Cevabınız hayır ise tüketmemenedeniniz?
1) Sindirim sorunu yaşıyorum
2) Mide bulantısı yapıyor
3) Tadı ve kokusu rahatsız ediyor
4) Tiksiniyorum
5) Diğer
22. Süt ve süt ürünleri tüketmemenedeniniz?
1) Besleyici olması
2) Doyurucu olduğu için
3) Vücudumuz için gerekli kalsiyum ihtiyacını karşıladığı için
23. Sütün 1 porsiyonundaki kalsiyum miktarını biliyor musunuz?
1) Evet ise açıklayınız
2) Hayır
24. Yoğurdun 1 porsiyonundaki kalsiyum miktarını biliyor musunuz?
1) Evet ise açıklayınız
2) Hayır
25. Peynirin 1 porsiyonundaki kalsiyum miktarını biliyor musunuz?
1) Evet ise açıklayınız
2) Hayır
26. Ayranın 1 porsiyonundaki kalsiyum miktarını biliyor musunuz?
1) Evet ise açıklayınız
2) Hayır
27. Yetişkin (19-55 Yaş)
bir insanın alması gereken günlük kalsiyum miktarını biliyor musunuz?
1) Evet ise açıklayınız
2) Hayır

APPENDIX 2: BesinTüketimSıklığıFormu (FFQ)

BESİNLER	Kod	Tüketir mi		Tüketim sıklığı										Miktar		
		Evet	Hayır	Her öğün	Her gün	Haftada 1 kez	Haftada 2-3 kez	Haftada	3-4 kez	Haftada 5-6 kez	Ayda 2-3 kez	Ayda 1 veya daha seyrek	Ölçü	Ağırlık		
Süt ve süt ürünleri																
Süt-tam yağlı																
Süt-yarım yağlı																
Süt-yağsız																
Yoğurt-tam yağlı																
Yoğurt-yarım yağlı																
Beyaz peynir(.....)																
Kaşarpeynir (.....)																
Peynir (.....)																
Ayran																

APPENDIX 3. Ethical Board Approval Form



T.C.
BAHÇEŞEHİR ÜNİVERSİTESİ REKTÖRLÜĞÜ
Klinik Araştırmalar Etik Kurulu

Sayı : 22481095-020-338

06/02/2018

Konu : Karar Örneği

SAYIN YEŞİM NURDAN ÖZKORUCUKLU

Araştırmacısı olduğunuz "Üniversite Öğrencilerinde Süt ve Süt Ürünleri Tüketimi, Kalsiyumun Antropometrik Ölçümlerle İlişkisi" isimli çalışmanız ile ilgili Klinik Araştırmalar Etik Kurulu karar örneği ektedir.
Gereğini bilgilerinize rica ederim.


Prof.Dr. Nazire Efser Yeşim AFIŞAR
FAK
Komisyon Başkanı

EK :
Karar Örneği

71
Pm:



BAHÇEŞEHİR ÜNİVERSİTESİ
KLİNİK ARAŞTIRMALAR ETİK KURULU

Üniversitemiz Klinik Araştırmalar Etik Kurulu'na ait 21 Haziran 2017 Tarih ve 2017-11/03 Sayılı Karar Örneğidir.

KARAR:2017-11/03

Yeditepe Üniversitesi Sağlık Bilimleri Enstitüsü, Beslenme ve Diyetetik Yüksek Lisans Programı Öğrencisi, Yeşim Nurdan ÖZKORUCUKLU "Üniversite Öğrencilerinde Süt ve Süt Ürünleri Tüketimi, Kalsiyumun Antropometrik Ölçümlerle İlişkisi" isimli tez araştırmasının başvuru dosyası görüşüldü.

Görüşmeler sonunda; Yeditepe Üniversitesi Sağlık Bilimleri Enstitüsü, Beslenme ve Diyetetik Yüksek Lisans Programı Öğrencisi, Yeşim Nurdan ÖZKORUCUKLU'nun "Üniversite Öğrencilerinde Süt ve Süt Ürünleri Tüketimi, Kalsiyumun Antropometrik Ölçümlerle İlişkisi" isimli tez araştırması gerekçe, amaç, yaklaşım ve yöntemleri dikkate alınarak; incelenmiş ve uygun bulunmuş olup araştırmanın/çalışmanın başvuru dosyasında belirtilen merkezlerde gerçekleştirilmesinde etik ve bilimsel sakınca bulunmadığına karar verildi.

Prof. Dr. Nazire AFŞAR
Etik Kurul Başkanı

APPENDIX 4. CIRRUCULUM VITAE

Personal Information

Name	YEŞİM NURDAN	Surname	ÖZKORUCUKLU
Place of Birth	ERZURUM	Date of Birth	06.06.1990
Nationality	Turkey	Turkish Id no	
E-mail	yesim_nurdan@hotmail.com	Phone	

Educational Status

Degree	Field	Graduated from	Graduation Year
Ph.D			
Master			
Bachelor	Nutrition and Dietetics	YeditepeUniversity	2015
High school	Sayısal (Science)	KadıköyİntaşHigh School	2009

Foreign Languages	Foreign Language Exam Grade ^(#)
English	

[#]If more than one, (KPDS, ÜDS, TOEFL; EELTS vs), all results must be noted

İşDeneyimi (Sondangeçmişedoğrusıralayın)

Position	Institution	Duration
Dietitian	Moodist Hospital	2018 Jan - current
Dietitian	DermanMedical Centre	2017 Nov
Nurse (intensive care)	Yeditepe University Hospital	2015 Oct-2018 Jan

Computer Knowledge

Software	Skill level*
Microsoft Office	Very good

*Write very good, good, average, poor

Scientific Work

Articles published in journals in SCI, SSCI, AHCI indexes

--

Articles published in other journals

--

Publications presented in international scientific meetings and published in proceedings

--

Publications in proceedings of peer-reviewed conference/symposiums

--

Other (Projects Participated/Certificates/Awards)

03. 2016 - Acıbadem Üniversitesi – 5. Ulusal Sağlıklı Yaşam Sempozyumu
03. 2016 - Acıbadem Üniversitesi – Bariatrik Cerrahi Diyetisyenliği Kursu
03. 2016 - Acıbadem Üniversitesi – Karbonhidrat Sayımı Kursu
06. 2015 - Yeditepe Üniversitesi - Beslenme ve Diyetetik Bölümü Yüksek Onur Derecesi Belgesi
06. 2015 - Yeditepe Üniversitesi - Hemşirelik Bölümü Yüksek Onur Derecesi Belgesi
10. 2014 - Okan Üniversitesi - Anadolu'da Beslenme, Yemek ve Mutfak Kültürü Katılım Belgesi
12. 2014 - Yeditepe Üniversitesi - Diyabet Farkındalık Eğitimi Belgesi
11. 2014 - Türkiye Obezite Derneği, Türk Diyabet ve Obezite Vakfı - EASO-OMTF COURSE
11. 2014 – Türkiye Obezite Derneği, Türk Diyabet ve Obezite Vakfı - VI. Ulusal Obezite Kongresi Katılım Belgesi
11. 2014 - Türkiye Obezite Derneği, Türk Diyabet ve Obezite Vakfı - Bariatrik Cerrahi Diyetisyenliği Kursu
05. 2013 - Bedensel Engelliler Dayanışma Derneği - Teşekkür Belgesi
03. 2013 - Yeditepe Üniversitesi - Kariyer Günleri Katılım Belgesi
04. 2012 - Yeditepe Üniversitesi - Kendini Tanıma ve Kişisel Farkındalık Sempozyumu Katılım Belgesi
12. 2012 – Yeditepe Üniversitesi - Hava Yolu ile Hasta Nakli Sempozyumu ve Uçuş Hemşireliği Çalıştayı Katılım Belgesi
05. 2012 - Sanitas - Klinik Araştırmalar Bahar Okulu Katılım Belgesi