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Young Adults' Milk Consumption Habits and Knowledge about Milk

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ABSTRACT This study was performed to determine young adults' milk consumption habits and their knowledge about milk. This is a descriptive study and sample is comprised of 205 young adults. Data were collected using a questionnaire and in face-to-face interviews. To check the questionnaire's reliability, the internal consistency coefficient was calculated and the Kuder Richardson (KR-20) value was found to be 0.77. The mean milk knowledge score was 17.50±4.21. It was found that males (17.54±4.36) scored higher than females (17.47±4.12). The 22-24 age group (18.14±4.34) scored higher than 19-21 age group (16.90±4.02). These differences in mean milk knowledge scores were not found to be statistically significant ($p>.05$). This study clarifies all the reasons why milk consumption should be increased. The reasearchers believe that sharing knowledge about milk's health benefits using media or other training methods is an important way to raise consumers' consciousness and prevent possible health problems.

INTRODUCTION

Milk has been known as an important source of human nutrition since 4000 BC (Tsuda et al. 2000), and humans have been drinking milk for thousands of years (Evershed et al. 2008). Milk can increase intake of not only calcium but also overall nutrient intake (Kim et al. 2016; Kurajdová et al. 2015). Of all the foods we eat, only milk contains all the different nutrients that "humans need" (Laakkonen and Pukkala 2008).

Milk is a well-known source of calcium. Fewer people know that milk is a protein source, full of B-group vitamins (thiamin, riboflavin, niacin, vitamin B_6, B_{12} and folate), and vitamin A, vitamin C, magnesium, and zinc, too (Fulgoni et al. 2007; Claeys et al. 2014). Milk provides roughly 70 percent of the calcium in our diets, and dairy products also supply 16 percent of our potassium, 30 percent of our phosphorus, 14 percent of our magnesium, 15 percent of our zinc, 18 percent of our protein, 16 percent of our vitamin A, 18 percent of our vitamin B_{12}, and 25 percent of our riboflavin (Hiza et al. 2005). Milk contains lactose, a carbohydrate, and small quantities of the fatty acids our bodies need. Milk fats are roughly 33 percent monounsaturated (Baysal 2014).

Milk is a lifelong staple in human consumption, supplying the calcium that builds strong bones, proteins that helps our brains and muscles to develop, vitamin A for good eyesight and the vitamin D that enables our bodies to digest calcium (Lonnerdal 2003). A lack of milk in our diet can cause vitamin D and calcium deficiencies for vitamin D and calcium (Anonymous 2010).

People tend to think of milk drinking as something children do and tend to drink less of it as they grow older (Garriguet 2008). However, insufficient milk consumption can lead to poor health. The US 2005 Dietary Guidelines stress milk and dairy foods as an essential component

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of a healthy diet for all people, regardless of their age (Anonymous 2010). Studies have shown that milk and dairy foods contribute to bone health and help to prevent cardiovascular diseases, high blood pressure, and Type 2 diabetes (Weaver 2010).

Human growth and development is a long process. Milk is very important due to its nutritional elements during growth periods, especially when growth occurs rapidly, for instance, in adolescence. Considering that young adults continue to grow in early adulthood, accurate knowledge about milk will lead them to increase their milk consumption.

Objective of the Study

The current research has the following objective. This study was performed to determine young adults' milk consumption habits and their knowledge about milk.

METHODOLOGY

The research sample comprised of 205 young adults chosen from a dormitory at Ankara University. This is a descriptive study. Data were collected using a questionnaire and in face to face interviews. The questionnaire has two sections: one solicits information about the demographics and milk consumption of the participants, the other is a list of statements about milk. To evaluate young adults' knowledge about milk, the participants were asked to decide on the accuracy of 27 true/false statements (Appendix). Specific resources were used to develop these statements (Anonymous 2006; Baysal 2014).

Statistical Analysis

To check the questionnaire's reliability, the Kuder Richardson internal consistency coefficient was calculated, and the KR-20 value was found to be 0.77, a satisfactory value. One point was given for each correct answer, and incorrect answers received no points. Students' knowledge about milk was analyzed according to their gender and age group variables. Tables were prepared to display the statistical analyses as mean, standard deviation ($\bar{X} \pm SD$) and percentage (%) values. The independent t-test was used to evaluate the students' knowledge about milk by gender and age group. An alpha level of $p<.05$ was used as the criterion for statistical significance.

RESULTS

Of the participants, 57.1 percent are female (n: 117), and 42.9 percent are male (n: 88). The percentage in the 19-21 age group is 51.7 percent, while the percentage in the 22-24 age group is 48.3 percent.

The milk drinking habits of the young adults are shown in Table 1.

Table 1: Milk drinking habits of the young adults

	n	*%*
Milk Drinking		
Regular	86	42.0
Irregular	119	58.0
Time of Drinking Milk		
In the morning	51	24.9
Snack time	127	61.9
Before sleep	27	13.2
Way of Drinking Milk		
Cold	111	54.1
Hot	19	9.3
Coffee with/without sugar	75	36.6
Total	205	100.0

Table 1 shows that 42 percent of the young adults stated that their milk consumption is regular, while 58 percent told that their milk consumption is irregular. Milk is mostly consumed during snack time (61.9%), while 24.9 percent of in the morning and 13.2 percent of before sleep in young adults. When milk consumption is examined; 54.1 percent of the participants drink it cold, to 36.6 percent of those as coffee with/without sugar and 9.3percent as hot. When the participants were asked when they acquired their milk drinking habits, it was determined 45.4 percent of them did so in preschool, 25.6 percent at the university, 17.4 percent in primary school and 11.6 percent in high school. Their reasons for regular milk consumption are: high nutritional value (37.2%), habit (32.4%), protecting bone health (23.3%) and to feel full (8.1%). The most important factors which increase the milk consumption are family and circles of friends (69.8%) and written or visual media (30.2%). Milk is consumed more in winters (37.2%). Winter is followed by summer (27.3%), autumn (18.4%) and spring (17.1%).

Milk Knowledge Scores

According to gender and age group variables of the students, mean milk knowledge scores, standard deviation and t-test results are given in Table 2.

The mean milk knowledge score of the sample is 17.50±4.21. It was found that males (17.54±4.36) scored higher than females (17.47±4.12), and the 22-24 age group (18.14±4.34) scored higher than 19-21 age group (16.90±4.02). These differences in mean milk knowledge scores were not found to be statistically significant *(p>.05)*. The reasons of not causing the diversity in results might be the close ages of the young adults, knowledge sharing and opportunities due to living together in a dormitory.

DISCUSSION

Milk is an important substantial contributor of basic nutrients that are required for normal growth and development in human nutrition (Cifelli et al. 2016). This study determined that there is a positive correlation between insufficient regular milk consumption and insufficient knowledge about milk. It also concluded that 42 percent of the young adults drink milk regularly. Similar results have been found by some studies (Simsek and Acikgöz 2011; Seker et al. 2012).

Most of the students drink milk at snack time (61.9%), and this is followed by breakfast (24.9%) and before going to bed (13.2%). Some epidemiological studies have shown that the calcium and magnesium in milk regulates insulin sensitivity and glucose tolerance, and that whey proteins also affect glucose control and insulin response. These ingredients can provide the feeling of being satiety (Belin and He 2007; Elwood et al. 2007; Kirii et al. 2010). Milk consumption at breakfast is important especially for students for this reason. Sevindi et al. (2007) determined that 13.8 percent of the individuals drink milk at breakfast, while Simsek and Acikgöz (2011) found that 6.1 percent drink milk at breakfast. Although this rate is higher in our study (24.9%), milk consumption at breakfast is still not sufficient. The percentage of drinking milk before bed was found 40.1 percent by Simsek and Acikgoz (2011), while it was found lower (13.2%) in our study. The reason of low-level milk consumption can be related with that students stay in a dormitory and there isn't much milk in dormitory meal plans.

The rate of drinking cold milk is high (54.1%). This may be due to the fact that milk is not processed and that it contributes to time management. Family can be an effective factor in the acquisition of the habit of regular milk consumption (45.4%) in preschool period. The main reasons for regular milk consumption are its high nutritional value (37.2%) and its calcium content's presence in the media. The primary reason for increasing milk consumption is family and circles of friends (69.8%), and this is associated with social customs. We can explain the high level of milk consumption in winter (37.1%) as an effect of the regularity of school life. Milk is also preferred because it is easy to consume and access, and provides fullness and satiety.

Milk contains a wide variety of vitamins, minerals and other nutrients (calcium, potassium, vitamin B_2, vitamin B_{12} proteins, etc.) (Mozaffarian 2011). Although milk is one of the best sources of protein (Boye et al. 2012; Claeys et al. 2014), the correct response rate for the incorrect statement, "Milk is not a source of protein" is low (29.8%). The nutritional elements in milk composition (Example: calcium, phosphor, magnesium, protein, some B vitamins) are a good for all age groups. Calcium has a key role in promoting and maintaining bone mineral density. Bone density in adulthood is correlated with the amount of

Table 2: Mean milk knowledge scores of young adults by variable

	n	*score*	*sd*	*df*	*t*	*p*
Gender						
Female	117	17.47	4.12	203	.126	.666
Male	88	17.54	4.36			
Age (year)						
19-21	106	16.90	4.02			
22-24	99	18.14	4.34	203	2.113	.287
Total	205	17.50	4.21			

milk consumed during the growth period (Boot et al. 2010; Rizzoli et al. 2010). The rate of the young adults who think the following some statements are correct is high: "Milk is the best source for the daily calcium requirement" (82.9%), "Milk is the best source of calcium" (91.2%) and "Milk's high nutritional value is important for all age groups" (93.7%). Zhao et al. (2016) found that children consuming milk on a daily basis met the DRI requirements more extensively compared with those who did not *($p<0.05$)*. Kim et al. (2016) reported that milk consumption in Korean adolescents is very low. Although the calcium content in milk is widely known, it is thought-provoking that consciousness levels about the protein content in milk are low. This is because the calcium content of milk is highlighted in the media (especially in commercials). Of the participants, only 29.8 percent gave the correct response to the incorrect statement "Milk is rich in iron." This result is due to insufficient knowledge. Milk has low amounts of iron, and its bioavailability is low. It is known that milk cannot meet iron requirements, especially in the growth period (Baysal 2014). Dairy products are highly important to get the most benefit from milk. But, they fail to meet the daily nutritional requirements of young adults due to the disadvantages about milk consumption. That is why it is important to drink more milk to increase its consumption. The majority, 67.3 percent of the participants gave the correct answer to the incorrect statement, "Dairy products are the best way to increase milk consumption." In our country, cheese and yoghurt are eaten during the main meals. Both of these milk products are consumed more than milk. Thus, it can be said that this decreases the correct response rate.

Milk and dairy foods have unique qualities that cause it to spoil and allow pathogenic microorganisms to proliferate in it (Nsofor and Frank 2013). The consumption of raw milk has been associated with numerous food borne illness cases and outbreaks (Verraes et al. 2014). For the statements, "Milk is an appropriate food for various microorganisms to multiply" (69.8%), and "When raw milk is boiled, some harmful microorganisms do not disappear" (71.7%), the correct response is two-thirds. Another incorrect statement, "Consuming raw milk is healthier," was answered correctly at the rate of 84.9 percent. Raw milk can still be obtained easily and preferred by families. Both these factors keep the correct response rates for these three statements below the desired level.

The ways of processing milk vary by temperature and duration. Pasteurization heats milk to a sufficient temperature for just enough time to eliminate pathogens (Nada et al. 2012). Sterilization, which includes Ultra High Temperature (UHT) treatment, eliminates all spores and extends milk's shelf life dramatically (Claeys et al. 2013). In developing countries with low milk consumption level such as Turkey, milk produced by small farmers and/or some intermediaries is sold directly to the consumer. A lengthy heat treatment (boiling) is applied to the milk by consumers. Boiling can be done at home to make milk microbiologically safe, but it also causes nutritional loss. Here are the correct response rates to the following statements related to milk processing: "There are no additives in UHT milk" (24.4%), "UHT should be used to preserve milk for a long time" (62.4%), "The shelf life of pasteurized milk is longer than that of UHT milk" (50.7%) and "There is no difference between the nutritional value of pasteurized and UHT milk" (20.5%).

According to the study, difference between pasteurization and UHT treatments and effects of them are not known. The belief that there are additives in UHT milk may be the reason raw milk is preferred. Milk offers a good habitat for microorganisms, and if it is not stored correctly germs will reproduce rapidly in it (Ronald and Davidson 2008). Raw milk has not been studied carefully. Nevertheless, the raw milk consumption involves microbiological risks (Claeys et al. 2013). Here are the correct response rates to the following statements: "The microorganism content of raw milk is high" (87.8%), "Boiling raw milk does not cause nutritional loss" (63.3%), "Heating raw milk at home is not suitable in terms of microorganism content and nutritional value" (81.0%), and "If unheated, milk can carry microorganisms and cause various infectious diseases" (84.4%). The prevalence of raw milk (street milk) consumption in our country also affected the participants' responses. The necessity of boiling milk for a long time to reduce its microorganism content causes nutrient loss. However, it is not widely known that boiling milk will lead to nutritional loss. This can be also understood from the low correct response rate for this statement. In our country, buying raw milk is a common practice for families. This prac-

tice and insufficient knowledge may increase raw milk consumption. The low correct response rate for the statement, "Carton packaging does not affect the taste or smell of milk" (52.7%) is because of insufficient knowledge.

Nutritional information directly affects the health of the individuals. Sufficient milk intake, especially low fat milk, and/or calcium intake can lower the risk of osteoporosis, hypertension, stroke and cancer (Engberink et al. 2009; Ralston et al. 2012). Assumpcão et al. (2016) found in a study carried out on adolescents that 88.6 percent of adolescents had a daily dietary calcium intake below the estimated average requirement. Consuming the recommended amounts of milk can help reduce the prevalence of some major chronic diseases (osteoporosis, type 2 diabetes and cardiovascular diseases, etc.) (Rafferty and Heaney 2008; Baysal 2014). Bone density, an indicator of bone health, is associated with regular milk consumption (Krebs-Smith et al. 2010; Kim et al. 2013). The correct response rate to the statement: "Bone mineral density is higher in individuals with the habit of regular milk consumption" is 79 percent, and for the statement, "Milk should be consumed regularly to protect bone health" it is 96.1 percent. These statements show that accurate information and policies about milk presented in the media have attained their goals.

The risk of cardiovascular diseases varies by the kind of milk consumed, ranging from whole milk to low-fat milk (Pereira 2014). Some research has indicated a meaningful link between low-fat dairy consumption and the risk of high blood pressure (Wang et al. 2008; Engberink et al. 2009; Ricci et al. 2010; Contreras et al. 2013). Milk proteins regulate blood glucose and prevent excessive food consumption and weight increase (Sousa et al. 2012; Bendtsen et al. 2013). The correct response rates for statements about the relationship between milk and illness are: "Milk makes you fat" (73.7%), "Regular milk consumption helps maintain blood pressure" (40.0%), and "Drinking milk at breakfast has a positive effect on blood sugar" (62.0%). It is known that some important nutritional elements in milk such as calcium affect the absorption of fatty acids generated during lipid digestion and/or bind bile acids, and consequently reduce the amount of digested fat and energy intake (Kirii et al. 2010). In the researchers' study, the correct response rate for the statement, "Milk increases body fat mass" (20%) is very low. Saturated fatty acids in milk have various effects on blood lipid levels. Rather than entirely eliminating the consumption of whole milk, low fat milk is recommended for people especially who are at risk of cardiovascular diseases and diabetes (Bazzano et al. 2013; Pereira 2014). Dairy consumption may have a protective effect against the development of cardiovascular disease (Moreno et al. 2015). The statement, "Adults should pay attention to drink fat-reduced milk" is included in the recommendations of medical nutrient treatment against increase of some chronic diseases in adulthood period. The correct response rate for this statement is 73.2 percent. If individuals consume the recommended amounts of milk, they can be healthier and maintain the habit of healthy food consumption (Pereira 2014). For the incorrect statement, "Milk should only be consumed during childhood" (96.1%), the correct response rate is high, while the correct response rate for the correct statement, "Children and young adults should consume at least two glasses of milk per day" is only 56.1 percent. The different answers to these analogous statements reveal the need for knowledge about milk consumption.

CONCLUSION

Milk is nutrient-rich food that may contribute to adequate nutrient intakes. In addition, it provides youngsters with energy, high-quality protein, and other essential nutrients. This study clarified all the reasons why milk consumption should be increased. Since milk consumption and a healthy diet are inextricably linked, milk is an indispensable source of nutrition. These findings confirm that the consumption of milk might be a marker for healthier eating habits.

RECOMMENDATIONS

Researchers who want to identify milk's dietary benefits and or disadvantages should not ignore the effects of food habits and lifestyle. Milk consumption should be marker for healthier eating habits. Sharing knowledge about milk's health benefits using media or other training methods is an important way to raise consumers' consciousness and prevent possible health problems.

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APPENDIX

Young Adults' knowledge about milk

Statements	*(Correct %)*
Milk is not a source of protein (F).	29.8
Milk's high nutritional value is important for all age groups (T).	93.7
Milk is the best source for daily calcium requirement (T).	82.9
Milk is the best source of calcium (T).	91.2
Milk is rich in iron (F).	29.8
Dairy products are the best way to increase milk consumption (F).	67.3
Milk is an appropriate food for various microorganisms to multiply (T).	69.8
When raw milk is boiled, some harmful microorganisms do not disappear (T).	71.7
Consuming raw milk is healthier (F).	84.9
There are no additives in UHT milk (T).	24.4
UHT should be used to preserve milk for a long time (T).	62.4
The shelf life of pasteurized milk is longer than that of UHT milk (F).	50.7
There is no difference between the nutritional value of pasteurized and UHT milk (T).	20.5
The microorganism content of raw milk is high (T).	87.8
Boiling raw milk does not cause nutritional loss (F).	63.3
Heating raw milk at home is not suitable in terms of microorganism content and nutritional value (T).	81.0
Unheated milk can carry microorganisms and cause various infectious diseases (T).	84.4
Carton packaging does not affect the taste or smell of milk (T).	52.7
Individuals who consume milk regularly have higher bone mineral density (T).	79.0
Milk should be consumed regularly to protect bone health (T).	96.1
Milk makes you fat (F).	73.7
Regular milk consumption helps maintain blood pressure (T).	40.0
Drinking milk at breakfast has a positive effect on blood sugar (T).	62.0
Milk increases body fat mass (F).	20.0
Adults should pay attention to drink fat-reduced milk (T).	73.2
Milk should only be consumed during childhood (F).	96.1
Children and young adults should consume at least two glasses of milk per day (T).	56.1

Note: (T) = true, (F) =false.