ANALYTIC STUDY OF UNIVERSITY STUDENTS' NUTRITIONAL HABITS AND ATTITUDES AS A PART OF SOCIETY IN TURKEY

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Abstract

The importance of proper nutrition as one of the enhancing nutrition attitudes, knowledge and important aspects of lifestyle were emphasized in the practices of students which has high importance, because recent years and the trend towards healthier diets subsequently will lead to more food-conscious increased.

The aim of this research is to understanding the nutrition knowledge, attitude and food habits of students at higher education programmes. This study has been carried out using subjects of 618 students consisting of 237 female and 381 male students attend from the educational programs present at the Namik Kemal University .A Likert type scale was used to evaluate each of the questions. The collected data was analysed by t-test, one-way ANOVA and Pearson correlation coefficient ($P<0.05$). In addition, this result supported by principal component analysis (PCA), descriptive statistical analysis which students' attitudes on nutritional habits. In research there was significant differences in the knowledge level between students of different departments ($F=3.06$; $p<0.001$). Principal component analysis was used to identify four main dietary patterns, and analysis of variance employed to examine the characteristics associated with them. Factor analysis reduced the 15 independent variables into four factor groups. This paper provides a unique insight into a wide range of nutritional habits among young's' in Turkey (e.g. vegetables, fast foods, milk products etc.-related) and reflects on the responses obtained from policy makers' towards food habits in Turkey.

***Keywords*:** students' nutritional habits, proper nutrition, eating attitudes, factor analysis.

Introduction

Food and nutrition have an essential role in children and young people's achievement at all stages of education. There is evidence that young people's food choices can affect their attendance and behaviour as well as their health. There have been considerable changes in human lifestyle all over the world in recent decades. The importance of proper nutrition as one of the enhancing nutrition attitudes, knowledge and important aspects of lifestyle were emphasized in the practices of students has high importance, because recent years and the trend toward healthier diets have subsequently lead to more food-conscious individuals. The main goal of healthy nutrition plans is to obtain the appropriate and necessary nutrition to remain healthy, to be physically prepared and to lead a healthy life. For this reason to promote the health level of a society, and the attitudes of its people, must be taken into account (Azizi et al., 2011). Given that one of the main goals of universities is to broaden the knowledge of the people in a society, the enhancement of the nutrition attitudes, knowledge and practices of its students is of high importance, as this will subsequently lead to a more food conscious society and more healthy people. Some studies have shown that most students are not familiar with the healthy foods needed for their body in different conditions (Cotugna et al., 2005; O'dea, 2004).

Elhassan et al., (2013) was to assess nutrition knowledge, attitude and practices among Ahfad University students. The other research showed that the majority of students (83.6%) eat three meals during the day regularly and no difference was found between men and women (Ruka et al., 2005). O'dea also exposed that 85% of men and 87% of women, who are overweight, decide to go on a diet to lose weight; also13% of men and 20% of women refuse to eat breakfast. He also reported that students do not have the necessary information and training regarding weight control, nutrition needs and diets (O'dea, Abraham, 2001). According to Gates students with normal weight have a more healthy diet and better points in terms of nutrition knowledge and attitudes compared the others (Gates, De Lucia, 1998).

There is no significant difference between knowledge and attitude between overweight and normal weight persons. In normal weight persons, the body mass index and body fat percentage were related to their attitude to nutrition (Lowry et al., 2000; Mitchell et al., 1999).

The aim of this research was to assess the nutrition knowledge, attitude and food habits of students at higher education programmes.

Materials and Methods

The study is a descriptive cross-sectional, community based study. The study included 618 students consisting of 237 female and 381 male students attend from the educational programs present at the Namik Kemal University are faculties of engineering, arts design and architecture sciences, economics and administrative sciences, theology, medicine, veterinary medicine, agriculture, foreign languages, health sciences, and five vocational schools.

The Questionnaire consisted of five parts and first part is about some personal information about students and their body composition. The second part contains questions that measure students' eating behaviour and its relation to nutrition knowledge. The third part includes some questions about student's attitudes toward nutrition habits. The forth part poses some questions about choosing the foods and the last part collects student's recommendations. In two and third parts the Comprehensive Assessment of Nutrition

Knowledge, Attitudes, and Practices CANKAP (Cunningham, Skinner, et al., 1981) test was used. Likert type scales (Triola, 1992) were used for those responses to the items testing nutritional behaviour. The university students identified their eating behaviour using a five-point scale, ranging from "Never", "Seldom", "Sometimes, "Usually, and "Always".

The collected data was analysed means, standard deviation and percents were calculated for the scores from the nutrition knowledge, attitude and food habits sections. Pearson's correlation coefficient were used to assess the correlation between nutrition knowledge, the attitude and analysis of variations (ANOVA) was used to evaluate nutrition knowledge and the attitude between majors, and an independent t-test was used to compare the nutrition knowledge and attitude between males and females. Statistical results were considered to be significant at $p \leq 0.05$. In addition, this result supported by principal component analysis (PCA), descriptive statistical analysis which students' attitudes on nutritional habits.

Results and Discussion

Table 1 shows the basic demographic characteristics of the students.

Table 1

The basic demographic characteristics

Variable	n	%
Gender		
Male	381	61.7
Female	237	38.3
Age		
18 -21	483	78.1
22-25	123	20.0
Above 26+	12	1.9
Current place of residence		
urban area	534	86.4
rural area	84	13.6
Permanent residence		
dormitory	141	22.5
at home with their friends	405	65.5
with family	51	8.3
with a relative	21	3.4
Family income		
less than 1000 TL	237	38.4
1000-2000 TL	273	44.17
more than 2500TL	108	17.48

Most (61.7%) of the participants were male. The mean age of the students was 20.5 years; nearly 78.1% of the total participants were aged between 18 and 21 years.

The family income of the majority of students was more than 2500 TL (17.48%), then between 1000 and 2000 TL (44.17%), then less than 1000 (38.4%).The mean values and standard deviation for age, height, weight and the body mass index (BMI) of the students are shown in Tables 2and 3.

It is known that age has a central role in the potential to improve especially the dietary habits and lifestyle behaviours of children and young adolescents and improving nutrition knowledge in young people may translate into educating them in good dietary habits. In order to promote healthy nutritional behaviours and prevent overweight and obesity, it is important to target this population with interventions concerning their eating habits and lifestyles (Grosso et al., 2012).

Table 2

Anthropometric characteristics of the students

Gender	Height(cm) (mean±sd)	Weight(kg) (mean±sd)	Age(yr) (mean±sd)
Male	177.9±5.9	70.8±11.5	20.8±2.2
Female	164.46±7.8	57.5±12.3	20.3±1.6
Total	171.15±8,9	66.78±13.2	20.5±2.4

Table 3

Body mass index of the students

Groups	Male		Female	
	Number	(%)	Number	(%)
Thinness (less than 20 kg/m^2)	86	22.6	60	25.3
Normal weight (20-25 kg/m^2)	169	44.3	67	28.3
Overweight (25-30 kg/m^2)	52	13.6	39	16.4
Obese (More than 30 kg/m^2)	25	6.6	19	8.1
No reply	49	12.9	52	21.9
Total	381	100.0	237	100.0

The results concerning nutrition practices also showed that 27.2% of the participants eat fish once or twice a month. In addition, 36.8% of the participants eat breakfast every day and 26.6% of the participants eat fruit every day, while 10% eat fruit only once or twice a week. Also only 10.8% of the participants drink milk every day. Only 20.8% of the participants said yes to the question of "Do you have any nutrition lessons?" Also there was a positive and significant correlation between diet and attitude of both female and male students. 22.8% of students were stayed at dormitory and 65.5% were stayed at home with their friends. No significant relationship was detected between the family income, ($p=0.334$), current place of resident ($p=0.574$). 90.3% of the students leave the meal and 61.6% they retard lunch. About the reason why they ate incomplete 48.3% of student told that they didn't have time. 70.1 % of the students have been educated in nutrition and 53.7% of the students didn't believe that they were healthily nourished. 20.6% of the students

prefer eating their meals at university refectory/dormitory-lodgings.

In this study was identified that the top five ranking foods consumed at high frequencies on daily basis included bread (93.4%), milk (44.9%), fresh vegetables (38%), cheese (35.4%) and egg (17.7%). While the top five foods indicated as never consumed by the students are fish (26.0%), lamb (25.4%) and beef (23.6%). The results from eating behaviour questions indicated that students in this study do not use a food guide to help them choose the food they eat. Consumption of fresh vegetables has been widely believed to promote good health; and protect human body from various diseases particularly those associated with deficiency of vitamins and minerals (Dietary Guidelines For Americans, 2014).

The frequency of consumption of milk and the frequency of consumption of nutriments in the fruit and vegetable group among students was under the necessary level. The most frequently consumed drinks were, successively water, tea and coffee. Results from eating practices showed that a high percentage of the students have unhealthy eating practices with less than or more than recommended dietary guidelines for most food groups therefore major changes in eating habits of this sample are required.

Table 4

Distribution of nutrition knowledge scores according to gender and BMI of university students

Variable	Nutrition knowledge score			
	n	**mean**	**sd**	**p**
Gender				0.001
Female	237	4.6	2.4	
Male	381	4.9	3.1	
BMI Classification				0.002
Thinness	86	4.8	2.3	
Normal weight	169	5.0	2.4	
Overweight	52	4.4	2.0	
Obese	25	4.2	2.1	
No reply	49	-	-	

Findings regarding the association between gender and BMI and nutrition knowledge are reported in Table 4. Means and standard deviations of nutrition knowledge scores are shown to highlight gender and BMI classifications. Higher nutrition knowledge scores were significantly associated with being thinness or normal weight ($p<0.002$).

Regarding the percentage of correct answers according to different constructs, among the group of questions concerning food nutrients the best basic knowledge was found on the item regarding the definition of vitamins (57.8% correct answers) and the worst on the item about balanced diet (37.7% correct answers). Knowledge about food contents was found to be generally acceptable, with about half of the students responding correctly to all items with the exception of the one regarding pasta and bread content (52.7% correct answers).

In this research was found that there was a positive and significant correlation between the knowledge and attitude level of both genders. Also knowledge level of male subjects was higher than that of female subjects. There was also a positive and significant correlation between the nutrition attitude and practice ($r=0.48$; $p<0.00$). It was obtained knowledge level of food engineering, medicine and health science are highest and arts design and architecture sciences and vocational schools are lowest. Using the one-way ANOVA, there was a significant differences in the knowledge level between students of different educational programs ($F=3.06$; $p<0.001$). Findings showed that students' knowledge of nutritional has a statistically significant influence on their nutritional behaviour ($t=2.885$, $p=0.004<0.01$).

Principial Component Analysis (PCA)

Principial Component Analysis (PCA) is recognised as being a powerful tool for pattern recognition, classification, modelling, and other aspects of data evaluation (Csomos et al., 2002; Škrbić, Onjia, 2002; Slavković et al., 2004). It eliminates the redundancy from the data, reducing their dimensionality by revealing several underlying components.

Initially, the aptness of the data for the PCA has been analysed with the KMO (Kaiser-Mayer-Olkin) test. The KMO value was 0.624, and the fact that the KMO value is higher than 0.50 shows that the variants are suitable for PCA and the number is sufficient. In addition to that, a global test has been made, according to the result; it has been shown that the samples drawn are at a level that can represent the population.

The principal components account for the total variance of the original variables (Table 5). The first principal component (PC1) accounts for the maximum of the total variance, the second (PC2) is uncorrelated with the first one and accounts for the maximum of the residual variance, and so on, until the total variance is accounted for. For a practical problem, it is sometimes possible to retain only a few components, accounting for a large percentage of the total variance.

Using the results of PCA, the four most important factors were identified, these being those that explained a high proportion of original variance and had Eigenvalue higher than one. These four factors combined to explain 68.25% of the total variance. The contribution of the variables to the main factors obtained in the PCA of components of nutritional habits and attitudes and variance explained are shown in (Table 5).

The data were analysed using factor analysis (Principal Components with Varimax Rotation). Factor Analysis reduced the 15 independent variables into four factor groups. Each factor group contains independent variables that are highly correlated with each other, but

no correlations exist among the factor groups. These factors can be defined as follows.

Table 5

Principal components loadings for nutritional habits and attitudes

		Factor Score	Percent of Total Variance Explained	Eigen-value
F1 (Dietary quality)	I'm carrying on a family tradition, my eating habits	0.828	27.21	3.077
	I think I have a healthy diet	0.712		
	I see my friends around me that the healthy diet	0.677		
	It is important that the taste of food is very nutritious	0.528		
F2 (Diet-related attitudes)	if you do enough exercise, you can eat whatever you like	0.701	18.64	1.911
	I have enough knowledge about balanced and healthy diet	0.627		
	I eat three meals every day	0.596		
	Food sold in the canteen affecting my eating habits	0.437		
	Sold in the canteen, toast, sandwiches, fast food more than I would prefer to eat school	0.431		
F3 (Nutritional knowledge)	I think, I'm a balanced diet	-0.662	11.28	1.514
	Generally, I prefer to eat the school cafeteria	-0.616		
	Schools are required to sell only healthy foods	0.590		
	In terms of nutritional value of the meals in the cafeteria does not meet my needs	0.504		
F4 (Healthy lifestyle)	I eat enough vegetables for my health	0.888	11.12	1.220
	I do 30 minutes of physical activity at least five days of the week	0.870		

The first factor summarizes four variables related to the *dietary quality* and explains 27.21% of the variance after varimax rotation.

The second factor contains five items that describe students' *diet-related attitudes* and explains 28.64% of the variance.

The third factor contains four statements and describes the *nutritional knowledge*. This factor explains 11.28% of the original variance.

The fourth factor summarizes two variables related to the healthy lifestyle and explains 11.12% of the variance after varimax rotation.

Conclusion

From this study it could be concluded that students should pay more attention to nutrition. Since university student will form the main body of families and professionals in every region and every society and they will represent the future parents (Bano et al., 2013). The time they spend at college is a golden period for learning and can promote nutrition knowledge, the attitude and practices of students. Therefore, an improvement in the learning environment related to nutrition, need to be emphasized on college campuses. Besides, media was the major source of information and not all students were aware of the health hazards of soft drinks and low intake of fruits and vegetables. The significant association between the students' study field and their nutritional knowledge magnifies the role of education. The students' attitude and practices needed improvement, emphasizing the need for further studies and a practical nutrition education programmes.

The main goal of nutrition plans is to obtain the appropriate and necessary nutrition to remain healthy, to be physically prepared and to lead a healthy life. For this reason to promote the health level of a society, the attitudes of its people must be taken into account. Given that one of the main goals of universities is to broaden the knowledge of the people in a society, the enhancement of the nutrition attitudes, knowledge and practices of its students is of high importance, as this will subsequently lead to a more food conscious society and more healthy people.

In order to remain healthy, physically active and enjoy a healthier life style it is necessary to obtain good nutritional knowledge and implement it. Mitchell et al (1999) identified that people with normal weight have a more healthy diet and better points in terms of nutrition knowledge and attitudes compared the others. The knowledge, attitude and practice must be considers in people in order to promote society health. According to Elhassan et al. (2013) one of the main goals of universities is to broaden knowledge of people of the society, so enhancing the nutrition attitudes, knowledge and practice of students have high importance because this subsequently will lead to more food-conscious society and more healthy people especially young adults.

In this research, the concept of healthy nutrition has been planned and conducted in order to determine the manners and the behaviours of the students that receive education at Namik Kemal University, towards nutritional habits. A significant association was found between the study field of students and their nutritional knowledge magnifying the role of education. The factors that affect students' nutrition selection, the evaluation of the concepts of healthy nutrition, personal opinions concerning nutrition levels, reasons of inclining towards healthy nutrition and research of the information obtained in line with the information sources about nutrition constitute the objective of this study. Some researchers have shown that nutrition knowledge was highly and positively related to the behavior toward nutrition (Mahe, 2000; Saegert, Young, 1983; Read et al., 1988).

The study indicated that, university students often miss meals, the most leaving out meal was lunch, the reason therefore was ‘don't have enough time’ and they had an unhealthy nutritional pattern. Activities like conferences with participation on a voluntary basis appeared to be more effective than previous obligatory lectures on the eating habits of the students. Reflection on these findings has led to one possible conclusion that young population should be educated and encouraged to promote healthier diets and lifestyles.

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