

RESEARCH ARTICLE

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The Relationship between the Nutrition Habits, Body Mass Indexes and Academic Successes of the Health School Students

ABSTRACT

Objective: This research was conducted to examine the relationship between university students' nutritional habits, body mass index and academic achievements.

Methods: The study was conducted with 213 students studying at a school of health in a private university. Socio-demographic characteristics, height and weights and eating habits were asked in the questionnaire applied to students who volunteered with the informed volunteer consent form. The academic success of the students was evaluated on the basis of the end of year weighted grade point average scores.

Results: More than half of the participants (51.2%) were students of the Department of Nutrition and Dietetics. The majority of students (69.5%) are among the normal values according to the Body Mass Index classification. Of the students, 35.7% think that they always eat healthy and 49.3% eat healthy intermittently. The ratio of the students who stated that they skipped main meals was 87.8% and most frequently skipped meal was the lunch for 60.6% of the participants. The ratios of the students who always consume snacks and who consume snacks from time to time were 27.2% and 65.7% respectively. The academic success of the students who consume snacks regularly was significantly higher. It was found that the academic achievement of students who thought that they were eating healthy was higher than that of the others. There was a weak but statistically significant negative correlation between students' body mass index values and academic achievement.

Conclusions: A relationship between students' nutritional habits and academic success was found in our study. In order to raise healthy, productive and successful generations, the importance of nutrition should be emphasized more especially in adolescent period in which life-time basic nutrition habits are adopted. Nutrition trainings and lessons may be useful for this purpose.

Keywords: Nutrition, Body Mass Index, Student, Academic Success

Sağlık Yüksekokulu Öğrencilerinin Beslenme Alışkanlıkları, Beden Kitle İndeksleri ve Akademik Başarıları Arasındaki İlişki

ÖZET

Amaç: Bu araştırma, üniversite öğrencilerinin beslenme alışkanlıkları, beden kitle indeksleri ve akademik başarıları arasındaki ilişkinin incelenmesi amacıyla yapılmıştır.

Gereç ve Yöntem: Çalışma bir üniversitede sağlık yüksekokulunda okuyan 213 öğrenci ile gerçekleştirilmiştir. Bilgilendirilmiş gönüllü olur formu ile gönüllü olan öğrencilere uygulanan ankette sosyodemografik özellikleri, boy ve kilosu, beslenme alışkanlıkları sorulmuştur. Öğrencilerin akademik başarıları ise yılsonu ağırlıklı genel not ortalamaları (AGNO) ile değerlendirilmiştir.

Bulgular: Araştırmaya katılan öğrencilerin yarısından fazlası (%51,2) Beslenme ve Diyetetik Bölümü öğrencisidir. Öğrencilerin çoğunluğu (%69,5) Beden Kitle İndeksi (BKİ) sınıflandırmasında normal değerler arasındadır. Öğrencilerin % 35,7'si her zaman, %49,3'ü ise bazen sağlıklı beslendiğini düşünmektedir. Öğrencilerin %87,8'i öğün atladığını belirtirken, %60,6'sı en sık öğle yemeğini atladığını belirtmiştir. Öğrencilerin %27,2'si her zaman, %65,7'si bazen ara öğün tüketmektedir. Düzenli olarak ara öğün tüketen öğrencilerin akademik başarıları istatistiksel olarak daha yüksek bulunmuştur (p<0,05). Sağlıklı beslendiğini düşünme durumuna göre öğrencilerin akademik başarıları arasında anlamlı farklılık olduğu saptanmıştır. Sağlıklı beslendiğini düşünen öğrencilerin akademik başarılarının bazen sağlıklı beslendiğini düşünen ve sağlıklı beslendiğini düşünmeyen öğrencilere göre anlamlı olarak yüksek olduğu bulunmuştur (p<0,05). Öğrencilerin beden kitle indeksleri ile akademik başarıları arasında anlamlı, negatif yönlü zayıf bir ilişki olduğu tespit edilmiştir (r= -,178; p=0,009).

Sonuç: Öğrencilerin beslenme alışkanlıkları ile akademik başarıları arasında ilişki saptanmıştır. Özellikle gelişimin devam ettiği ve kazanılan alışkanlıkların erişkin yaşlarda devam edebileceği adolesan çağda sağlıklı, üretken ve başarılı nesiller yetiştirmek amacıyla beslenme konusuna daha çok önem verilmelidir. Beslenme eğitimleri ve teşvikler bu amaca faydalı olabilecektir.

Anahtar Kelimeler: Beslenme, Beden Kitle İndeksi, Öğrenci, Akademik Başarı

INTRODUCTION

There are many factors that determine our health. Our lifestyle has an important place among these factors. The most important element of our lifestyle is nutrition. People's healthy living, being productive and successful are related with adequate and balanced nutrition (1). Adequate and balanced nutrition is the intake of all the nutrients necessary for the growth of the body, the renewal and functioning of the tissues in sufficient quantity, in the required amount and the proper use in the body (2). Inadequate and unbalanced nutrition has negative effects on mental development as well as physical development, namely it causes a decrease in learning, intelligence averages and also leads behavioral disorders (3). Poor nutrition also affects the immune system negatively and decreases the body resistance. Nutrition plays an important role on the efficiency of school and business lives (4).

Sociodemographic and geographic features can create differences in nutritional habits. Unbalanced eating habits can be seen more in families with low economic status. In addition, if the family also has poor and unbalanced eating habits independent of the socioeconomic conditions, individuals grown in such families may maintain poor eating habits in the future (5).

Balanced, regular and adequate nutrition is important for healthy growth and development in the adolescent age (6). In addition, increasing aesthetic concerns during adolescence can cause inadequate and imbalanced eating habits. These aesthetic concerns are especially high among young females (7). Especially during these periods, the frequency of eating out increases due to social activities, staying in dormitories or not being able to prepare their own meals (8). Unhealthy food alternatives such as junk food and fast food cause deficiencies in a healthy and adequate diet. Junk food and fast food do not adequately meet the micronutrients needed by the body (9).

A significant number of students attending higher education live away from their families and this creates difficulties in nutrition, housing, school expenses and health problems. Nutrition is a problem especially for students staying in dormitories (10). In our country, studies about the dietary habits of university students reported that there are serious problems with nutrition such as irregular eating habits and skipping meals, especially the breakfast. (8).

When fed with high-energy but non nutritious foods, obesity and overweight condition may develop along with unnecessary calories. Problems that start in this period can cause adolescents to become obese and overweight adults. Solving these problems is much more difficult in adulthood than in adolescence (11). The body mass index (BMI) is the most common and valid standard height-weight index accepted by the World Health Organization (12). Individuals

according to BMI values are classified as weak, normal, overweight and obese. Obese people can also be divided into classes among themselves.

In a research conducted on 1,120 students at Atatürk University, it was found that the nutritional habits and nutritional knowledge levels of the students were largely far from ideal. In this study, a positive correlation was found between students' body mass index and nutritional habit score, monthly personal income (13).

In a study conducted on the first year university students, factors such as nutrition habits, sleep time, awakening time, exercise, mental health status that might affect academic success were examined. Positive effects of breakfast on memory were emphasized (14). In order to achieve better concentration and higher academic success levels breakfast is essential. In a study conducted on 115 adolescents, the students who have regular breakfast habits were found to have more ability to comprehend arithmetic (15). Breakfast is important in terms of concentration, especially in school-age individuals. In addition to this, it is also effective on academic performance since cognitive performance will decrease when breakfast is skipped. Starting the day with breakfast has an effect on short term and long term memory (16). In a study, it was found that breakfast consumption 30 minutes before the exam had positive effects on recall skills (17).

This research was carried out to determine the nutritional habits and body mass indices of university students and to examine the relationship of these characteristics with academic success.

MATERIAL AND METHODS

This descriptive study was carried out with 213 students of the school of health in a private university in Istanbul. The target group was 402. The study group was 213. The participation rate was 53%. Approval from the Ethics committee and institutional permissions were obtained for the implementation of the research (Decision No: 29.11.2016, 55-14; Institution permission date: 11.01.2017).

The study was conducted on a voluntary basis, and a questionnaire was applied to the students after the informed volunteer consent form. In the creation of the questions in the survey form we based on the questions applied in the work of Yilmaz and Ozkan (2007) (18). In the survey form we asked the gender, age, sociodemographic variables, nutritional habits, weight and height. Some variables can be seen in Table 1 and Table 2. The students provided their height and weight measurements and the researchers calculated the index values for each student.

The academic success of the students was determined regarding their weighted Grade Point Average (GPA) scores obtained from Student Affairs Office. The data were analyzed using the

SPSS statistics program. The significance level was taken as $p < 0.05$ for all statistical analyses. Frequency and percentage calculations, one way analysis of variance (ANOVA), student t test and Pearson correlation analysis were used to analyze the data.

RESULTS

Mean age of the participants was $21,69 \pm 2,77$. 84.9% of the students was female. The average body mass index of students was calculated as $21,9 \pm 3,19$. Socio-demographic characteristics of the participants were provided in Table 1.

Table 1. Sociodemographic characteristics of Students

Sociodemographic Variables	N	%	
Department	Nutrition and Dietetics	109	51.2
	Midwifery	20	9.4
	Physiotherapy and Rehabilitation	74	34.7
	Health Institutions Management	10	4.7
BMI (Body Mass Index)	Weak	32	15.0
	Normal	148	69.5
	Overweight	28	13.1
	Obese	5	2.3
Grade	First	30	14.1
	Second	58	27.2
	Third	47	22.1
	Fourth	78	36.6
Last School Graduated	Vocational High School	16	7.5
	High School	28	13.1
	Science/Anatolia/Super High School	137	64.3
	University / College	32	15.0
Where to Stay	With their parents	116	54.5
	At the dormitory	44	20.7
	At home with friends	38	17.8
	Other	15	7.0
Income status	Income less than expense	28	13.1
	Income equal to expense	125	58.7
	Income more than expense	60	28.2
Source of the allowance	Family	154	72.3
	Scholarships or loans	59	27.7
Mother's Educational Background	Not literate	2	.9
	Elementary school graduate	93	43.7
	High school graduate	80	37.6
Father's Educational Background	College graduate	38	17.8
	Elementary school graduate	53	24.9
	High school graduate	84	39.4
Father's Educational Background	College graduate	76	35.7
	TOTAL	213	100.0

More than half (54.5%) of students said that they have received nutrition related training previously. When asked which meal they cared most about, 41.8% of the students answered breakfast and 41.3% answered dinner. We determined that students attached equal importance

to breakfast and dinner. It is seen that 15% of the students do not think that they were eating healthy. 34.7% of them were skipped meals, 53.1% sometimes skipped meals and it was seen that the most skipped meal was lunch (60.6%) (Table 2).

Table 2. Relationship Between Nutritional Habits, Sociodemographic Variables and Body Mass Index

NUTRITIONAL HABITS AND SOCIODEMOGRAPHIC VARIABLES		BODY MASS INDEX			Total	
		Weak	Normal	Lightweight and fat		
Get nutrition training	Yes	21	80	15	116	
	No	11	68	18	97	
Think eating healthy	Yes	12	57	7	76	
	Sometimes	17	69	19	105	
	No	3	22	7	32	
Which meal the most important	Breakfast	14	65	10	89	
	Lunch	4	23	7	34	
	Dinner	13	59	16	88	
	Other	1	1	0	2	
Skipping meal	Yes	12	52	10	74	
	Sometimes	17	75	21	113	
	No	3	21	2	26	
Most skipped meal	Breakfast	10	58	16	84	
	Lunch	22	90	17	129	
Snack consumption	Yes	13	39	6	58	
	Sometimes	0	13	2	15	
	No	19	96	25	140	
Where to Stay	With Family	20	83	13	116	
	At the Dormitory	7	26	11	44	
	At home with friends	4	27	7	38	
	Other	1	12	2	15	
Department	Nutrition and Dietetics	19	78	12	109	
	Midwifery	2	14	4	20	
	Physiotherapy and Rehabilitation	11	51	12	74	
	Health Institutions Management	0	5	5	10	
Where it meets the allowance	From family	25	108	21	154	
	From scholarships or Loans	7	40	12	59	
Income status	Income less than expense	3	18	7	28	
	Income equal to expense	16	93	16	125	
	Income more than expense	13	37	10	60	
Mother Status	Education	Not literate	0	2	0	2
		Elementary school graduate	9	70	14	93
		High school graduate	17	50	13	80
		College graduate	6	26	6	38
		Elementary school graduate	5	37	11	53
Father Status	Education	High school graduate	19	56	9	84
		College graduate	8	55	13	76

When questioned the reasons why you skipped meals, the students were "I could not wake up in the morning (29.6%)", "I did not have an appetite / no craving (29.1%)", "I can not have a preparation (26.3%)", "I'm late for school (26.3%)" answered. When questioned like where you consume the snack food 63.8% of students said that they consume in the home environment, 44.6% in the restaurant / cafe / patisserie and 32.9% in the school / dormitory canteen refectory. It was determined that, 27.2% of students consumed every

time but 7.0% consumed sometimes snack foods and 65.7% did not consume snacks. The foods and beverages that students have stated that they consume the most at breakfast were listed as cheese (88.3%), tea (81.2%), egg (76.5%), bagel / bread (67.1%); the foods and beverages that consumed the most in the lunch and dinner meals by them were seen such as meat / chicken / fish / meatball (89.7%), soup (81.2%), salad (76.1%), bread (58.7%), meatless vegetable dishes (55.9%), rice (54.9%), legumes (53.5%), pasta (52.6%),

vegetables with meat (47.9%), milk / yogurt / ayran (65.3%), juice (62.9%) .

When the body mass index is classified as weak, normal, overweight-obese no statistically significant relationship was found in terms of body mass index, nutritional habits, sociodemographic characteristics and foods consumed in meals. The rate of overweight and obese people was 11.0% in Nutrition and Dietetics Department and this rate was 16.2% for the Physical Therapy and Rehabilitation Department, 20.0% for the Midwifery Department and 50% for the Health Institutions Management. When the curricula of the departments are examined, it is noteworthy that there are no courses on nutrition in other departments.

Findings Regarding Relationships Between Body Mass Index and Academic Success

- GPA scores of students with normal weight was found to be significantly higher than those of overweight students (one way analysis of variance, $p = 0.034$).

- A significant negative correlation was found between students' body mass index values and GPA scores (pearson correlation analysis, $r = -.178$; $p = 0.009$).

Findings Regarding Relationships Between Nutritional Habits and Academic Success

- It has been determined that there is a significant difference between students' academic achievement according to the state of thinking that they are eating healthy. It was found that the GPA scores of the students who thought that they always eat healthy was higher than those of students who thought that they eat healthy sometimes and who thought that they eat unhealthy (one way analysis of variance, $p < 0.05$).

- There is a significant difference between students' GPA scores according to the snack consumption (one way analysis of variance , $p < 0.05$). The GPA scores of students who consume snacks regularly were found significantly higher than those of students who doesn't consume snacks.

- There was no significant relationship between any of the other parameters mentioned in Table 2 and GPA scores.

DISCUSSION

In our study, the relationship between university students' body mass index, sociodemographic factors, eating habits and academic achievements were examined. The average body mass index of students was normal.

In a study conducted on Faculty of Education Sciences students to determine the nutritional consumption status, nutritional habits and nutritional knowledge levels according to the BMI 65.4% students were normal and 0.6% were obese (19). In this study, the low number of obese can be interpreted that obesity was not common yet

before 2000s. In another study conducted with adolescents 14.7% of students were overweight (20). In a study conducted with students studying at the Vocational School of Health Services, 69.7% of students' the body weight were found to be normal weight, 18.8% were overweight (21). In another study conducted on 424 students, 15.6% were overweight and 2.4% were obese (22). In the studies published in 2000s, the remarkable situation is the decrease of the weak students and the increase of overweight and obese students.

In another study conducted on 424 students regarding nutritional habits, most of students skipped meals and it was observed that the most important reason for this was the lack of time (22). In another study, the main meal that students skip the most was breakfast and the vast majority of them were overweight, indicating that the students did not eat enough, balanced and regularly (1). In another study, it was found that most of the students skipped the main meal and the most skipped meal was lunch (23). In another study conducted with higher education students, it was found that the most irregular and inadequate food consumed meal was the morning meal and 20.3% of students skipped one of the three meals daily (24). The most common reason for skipping meal is stated as not having time. The reasons stated as the reason for skipping meals are generally related to unplanned life and wrong eating habits (24). While the nutritional habits, the effecting factors and the nutritional status of 557 students studying at the Faculty of Medicine were examined it is found the students who were fed with three main meal a day were 29.6%. The percent of the students who are fed with three main meal plus at least one snack food were 41.3%. It was determined that the main meal that students attach importance to was dinner (25). In a study conducted with university students, the most skipped meal among the students was breakfast (26). In another study 52.48% of the students prefer to have their meals in the restaurant. 27.46 % of students skip the breakfast in the morning. Students showed for unwillingness, lack of time and similar reasons in this regard (27). In another study, it was determined that 61.2 % of students did not have breakfast because they're late to the lesson or did not have time (28). Different from these research results, in our study when asked which meal they cared most about we determined that students attached equal importance to breakfast and dinner. In our study, it was determined that 15% of students did not think that they were eating healthy, 34.7% of them skipped meals always and the most skipped meal was as lunch. As a result, the less important meal for the students is determined as lunch in our study.

In order to take energy and nutrients at the recommended level during the youth period, attention should be paid to the consumption of main and intermediate meals. The number of meals is

important in adequate and balanced nutrition. Skipping meals, especially breakfast, negatively affects school success in children and adolescents, it prepares the ground for inadequate and unbalanced nutrition (29,30).

In a study, it was seen that most of the students had breakfast at the dormitory, and preferred cheese-bread, pastry, bagels and tea (31). In the other study, the most preferred foods by university students for breakfast were cheese-olives, bagel and tea (32). Similar to these findings, in our study the foods and beverages that students stated that they consume the most at breakfast were cheese, tea, egg and bagel / bread.

In a study conducted with the students of the Faculty of Education, it is found 55.6% of students had breakfast in the morning (19). In another study conducted with the students of the Faculty of Health Sciences, 69.7% of students have breakfast every day (33). In a study conducted on 144 students, 16.7% of students never reported having breakfast, and the frequency of those who regularly consume breakfast, dinner and snacks was 32.6%, 75.0% and 23.6% was seen respectively (34). In a study conducted with students at the School of Health, students' regular breakfast, lunch and dinner consumption rates were 72.5%, 88.4% and 98.5% respectively (35). In a study conducted with university students in Nigeria, the most skipped meal was found to be breakfast with a rate of 73% (36).

In our study, a significant negative correlation was found between students' body mass indexes and academic achievement. In a study (Hollar et al., 2010) conducted with 4588 students, assessed the effects of a school-based obesity prevention intervention that included dietary, curricula, and physical activity components on body mass index (BMI) percentiles and academic performance among low income elementary school children. It was observed that more obese students in the intervention than in the control decreased their BMI percentiles. Intervention students had significantly higher math scores (37).

In a study aimed to determine the relationship between the nutritional habits of university students and their academic success it was determined that 66.2% of the students had normal weight and there was a negative correlation between the nutrition habits index scores of the students and their academic success points. It was determined that as the risk level of nutritional habits of students increased, their academic success decreased (38).

In a study it was found that there is a relationship between academic failure and social inequality. Students with lower socio-economic level have lower academic achievement than students with upper socio-economic level (39). While the increase in the education level of the mother and father affects nutrition positively, the

increase in the monthly income of the family increases the fast food consumption (40). In our study, no significant relationship was found between the mother or father education level, the students' body mass index and academic success.

In our study, the academic success of students who stated that they consumed snacks was found higher than students who stated that they did not consume or sometimes consumed. It is the right approach to gain the habit of consuming snacks in the daily diet. Snack consumption prevents individuals from eating too much and contributes to the regulation of fasting blood sugar. In a study, it was determined that 91.7% of the participants were consuming snacks (41). Similarly, in another study, it was found that 90.0% of university students have snack habits (42). It is necessary to pay attention to the consumption of snacks in order to get energy and nutrients at the recommended level and for school success in youth (31).

In our study there was no significant relationship between skipping meals and GPA scores. Different from our research results, in a study conducted by Diremler in 2009, it is seen that the average success of students who do not skip meals during the day is higher than those who skip meals (43). In a study conducted on 115 adolescents, it was found that the adolescents who had regular breakfast their abilities to grasp the arithmetic were higher than those who did not have breakfast (15). According to the results of 47 studies that examined the relationship between breakfast consumption and nutritional efficiency, body weight and academic performance in children and adolescents, skipping breakfast is quite common in the USA and Europe (10% - 30%) depending on age group, population and definition. Evidence supports that breakfast consumption can improve cognitive function related to memory, test grades and school attendance (29). In a study conducted on 5200 students in Canada, it was found that socioeconomic factors and diet quality had a significant impact on academic performance. The same study emphasizes the effect of not only breakfast but also food quality on the academic performance (44).

According to the findings obtained in a research conducted with the students studying in the college; 34.0% received nutrition education, 75.5% received this education from the school and 24.5% from the conference-panels; 36% believed that they were eating healthy and 64% did not believe that they were eating healthy (45). In our study, more than half (54.5%) of students said that they have received nutrition related training previously.

CONCLUSION AND SUGGESTIONS

As a result, in our study, it was found that the students with normal body mass index, who were eating healthy and consuming snack meals had higher academic success. A biopsychosocial

approach can be applied to students with high body mass index in the medical centers of universities with a team of medical doctors, nutritionists and dietetics specialists and psychologists. Considering that the habits to be acquired in adolescence and the disturbances that may occur will continue in adulthood, this period is very important. Growing successful, healthy and productive generations in

the future is possible with sufficient and healthy nutrition. Healthy eating habits should be gained primarily at home; everyone who gives education to children and adolescents should be aware of this issue. In this context, it is thought that it would be an appropriate approach to place nutrition lessons in the whole education programs of medical schools and health sciences.

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