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Research Article

The comparison of nutritional and physical activity statuses in students of Audiology and Nutrition & Dietetics

Ayşe Güneş Bayir* and Zeynep Hüdanur Alban

Department of Nutrition and Dietetics, Faculty of Health Sciences, Bezmialem Vakif University, Istanbul, Turkey

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***Corresponding author:** Ayse Gunes-Bayir, Assistant professor, Department of Nutrition and Dietetics, Faculty of Health Sciences, Bezmialem Vakif University, Silahtarağa Caddesi No: 198, 34065 Eyüp, Istanbul, Turkey, Tel: +90 212 453 17 00-4596;
E-mail: agunes@bezmialem.edu.tr

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Abstract

This study aimed to assessment and compare nutritional and physical activity status of Nutrition&Dietetics and Audiology Departments.

The study was carried on students of Bezmialem Foundation University Faculty of Health Sciences Nutrition&Dietetics (experimental group) and Audiology (control group) Departments in 2016/2017 academic year. The survey included socio-demographic characteristics, 24-h recall Food Consumption Record, Food Frequency Questionnaire to determine nutrition and physical activity. Body Mass Index, waist circumference and body fat mass ratios were measured by bioelectrical impedance device.

Overall, 220(66%) students participated, 125(84%) from experimental group and 95(46%) from control group. 75% of experimental group and 73% of control group were calculated as normal weight and mean body fat ratios were normal (24.3% and 22.8%, respectively). However, energy, water, carbohydrates, some vitamins and minerals were inadequate for two groups and fat consumption levels were high. 34% of those in control group had skipped breakfast meals, and they had unhealthy attitudes like chocolate and biscuits. Daily dairy products consume were found experimental group more than control group (p<0.05). 55% of experimental group and 58% of control group had regular physical activity.

Health professionals need to be more conscious about healthy life, which includes adequate-balanced nutrition and regular physical activity.

Introduction

Today, changes in lifestyle habits, including nutrition and physical activity habits, that the prevalence of obesity for public health caused a significant increase in the last 20 years considered to be a serious threat in Turkey [1,2]. In order to stop this increase, it is recommended to provide public health education including balanced nutrition and physical activity [2].

Students have more hardship in making healthy food choices with the increased independence reason of transition from high school to university [3]. In the transition period to adulthood, where models of healthy behaviours are formed, university students are exposed to unhealthy eating habits [4]. It is known that unhealthy eating habits are also affected by the inadequate exercise habits, poor time management and increasing stress caused of education life (university lifestyle, exams, etc.) [3,5,6]. At the same time, it has been shown to be associated with students are uninformed about healthy food choices, increasing financial concerns and health problems [3,7]. In addition, it seems that the nutritional environment of the university (such as inadequate options such as cafeteria, refectory) affects the adoption of unhealthy eating habits [8].

According to the qualitative research, most of the university students' eating habits were considered unhealthy [4,9-11]. A study conducted in Finland found that university students are fond of unhealthy foods [4]. According to research conducted at 5 UK universities, male students are consume based on ready meals, alcohol and red meat [9]. In another study, male students adopted the Western-type diet model and women adopted the vegetarian / low-calorie diet model at private universities in Lebanon [10]. It has been found that students studying at the

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state university in Bangladesh are eating unhealthy due to various reasons such as nutrition education and conditions of nutrition [11].

The impact of physical activity on health behavior patterns, such as eating habits also known [12-14]. Regular physical activity has positive effects on physical, social and mental health [12,13,15,16]. On the other hand, appropriate and regular physical activity; reduces the risk of developing chronic disease, improves quality of life and well-being, and improves cognitive mechanism [15-19]. The World Health Organization (WHO) recommends that adults aged 18 to 64, exercise in moderate physical activity for at least 150 minutes per week or severe physical activity for at least 75 minutes per week [20]. It was seen that physical activity decreased during the transition period from high school to university especially in males [21,22].

The assessment studies have accomplished on university students of health professions about nutrition and physical activity in Turkey [22-25]. According to the studies it is observed that students have unhealthy behavior models although they take courses in health field [22,24]. However, interdepartmental nutrition and physical activity assessment and comparison studies were found to be insufficient [22,24]. There is no study on Audiology (ADY) and Nutrition & Dietetics (ND) students in the literature. Accordingly, the study was planned and conducted to determine and compare the nutritional and physical activity status of the students of ND Department and ADY Department of the Faculty of Health Sciences.

Materials and methods

Ethical aspects of research

This study was approved by Bezmialem Vakif University Ethics Committee for Non-Interventional Studies (No: 54022451-050.05.04-9/89). In line with the Helsinki Declaration, the students who were invited to the study were informed about the purpose, expectations and the necessary information about the research and then received verbal and written consent to participate in the study.

Formation of research groups

In the 2017-2018 academic year, the students of Bezmialem Vakif University Faculty of Health Sciences (Istanbul, Turkey), ND (experimental group, n=149) and ADY (control group; n=209) Departments formed the study groups (n=358).

Data collection tools

In the study, an including the scales a modified questionnaire from Bayır and Güçlü (2018) was conducted by the researcher's face-to-face interviews with the participants. The survey consists of 5 separate sections; socio-demographic data, anthropometric measurements, nutritional habits, nutritional status assessment scales that used from 24-h recall Food Consumption Record and Food Consumption Frequency Form. In addition, a questionnaire was used to evaluate physical activity [22]. Anthropometric measurement applied to each participant with the same tools in the practice laboratory was performed by trained researchers. Height measurement was measured wall-mounted height scale measuring cylinder (ADE; Tarti medical, Istanbul, Turkey), body weight and body fat mass (BFM) ratio analysis was measured bioelectric impedance analyzer (BIA) (Tanita MC 780; Tarti medical, Istanbul, Turkey) and waist circumference was measured with tape (ADE; Tarti medical, Istanbul, Turkey) were recorded. Body Mass Index (BMI) values were calculated by weight (kg) / height^2 (m^2) and classified according to WHO's BMI standards [26]. In this classification, BMI is less than 18.5kg/m2 were accepted as underweight, 18.5-24.9kg/m^2 were normal weight, 25 to 29.9kg/m^2 were overweight (pre-obese), 30.0 - 34.9kg/m^2 were first degree obese, 35-39.99kg/m^2 were II. degree and ≥40.00 kg/m^2 were III. degree was determined to be obese. The waist circumference that determines the risk of abdominal obesity was determined by WHO as 88cm and above for women and 102 cm and above for men [26]. In the questionnaire that was contained main and intermediate meals, skipping meals, frequency of eating out, frequency of fast food consumption, daily water consumption, smoking and alcohol habits, the most preferred cooking methods, frequently consumed food groups etc. used in the research. 24hour dietary recall [27], was used with all amounts of food and beverages consumed by the participants. Food frequency questionnaire (FFQ) [27], was used to determine the frequency of food consumption and food groups by day, week or month. Forms were filled using visual materials (My plate food replicas; Nasco, Wisconsin; USA) (Figure 1). Questions were asked to determine the state of physical activity.

Data analysis

The data obtained from FFQ and 24-hour dietary recalls were analyzed by Nutrition Information System (BeBIS; Pacific Electrical, Electronic and Environmental Technology Products Industry and Trade Limited Co., Istanbul, Turkey). BeBIS is a

Figure 1: My Plate Food Replicas Used as Visual Materials.

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software program, by which can be analyzed diet forms and calculates over 20,000 nutrients, portion sizes, over 450 dishes and ingredient lists, and over 130 nutrients (macronutrients, pulp, vitamins, minerals, amino acid and fatty acid varieties, vegetable protein etc.). In addition, the portion amounts of the participants can be calculated and compared with the standard portions of BeBIS.

Statistical analysis of all data obtained from the study was performed using IBM SPSS (version 22.0) software program. Qualitative data were calculated with mean, median, minimum-maximum and standard deviation. Chi-Square, Mann-Whitney and Student-T tests were used to compare the groups. The results were considered statistically significant when the P value was less than or equal to 0.05.

Results and discussion

More than half of the students (66%, n=220) participated in the study conducted at Bezmialem Vakif University, Faculty of Health Sciences. A total of 46% of the participants were from the ADY Department (n=95) and 84% from the ND Department (*n*=125).

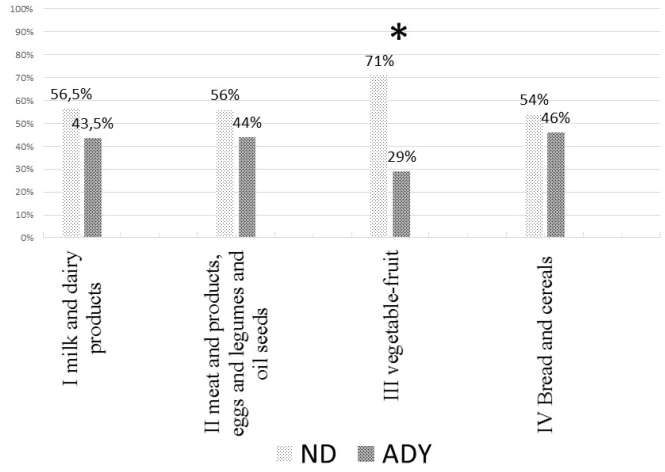
The data on the socio-demographic and anthropometric characteristics of the students participating in the research are presented in Table 1 as a comparison of the sections. ND and ADY students are between 18 and 23 years old. According to the WHO-defined BMI classification [26], 15% (*n*=19) of the ND students were underweight, 75% (*n*=94) were normal, 6% (*n*=8) were pre-obese, 2% (*n*=3) were I. degree obese, and 1% (*n*=1) were II. degree obese found in ranges. Similarly, 12% (*n*=11) of ADY students were underweight, 73% (*n*=69) were normal, 13% (*n*=12) were pre-obese, 2% (*n*=2) were I. degree obese, and 1% (*n*=1) were II. degree obese found in ranges. No differences were found which median BMI (min-max) values of ND students were 20.9kg/m² (15.8-38.8) and ADY students were 21.3kg/m² (16.7-38.8) (*p*=0.323). According to TBSA-2010 report, underweight ones were 5.1%, normal ones were 57.7%, pre-obese ones were 26.9% and obese subjects were 9.7% when the average BMI values of individuals between 19-30 [29]. In a study, the BMI classification of university students was found to be like this study [30]. When the median (min-max) measurement of BFM ratio of BIA device were examined; ND Department was found to be 23.4% (3.8-39.6), while the ADY Department was found to be 22.60% (4.5-45.6) (*p*=0.144). In another study conducted with 229 students in the Faculty of Medicine, it was found that the mean BFM ratio was similar [31]. When the waist circumference of women with ≥88 cm and men with ≥102 cm are examined, it is respectively 12% (*n*=15) and 8.4% (*n*=8) of ND and ADY students. A cross-sectional study of 1934 university students in a university where is in Jordan found that the waist circumference of ≥ 88 cm in females and ≥ 102 cm in males of the students was 4.9% (*n*=90) [32] Graphic 1.

When the nutritional habits of the students were examined, 91% of the students of the ND (*n*=111) and ADY (*n*=86) Department skipped meals. On the other hand, 19% (*n*=21) of ND students who skipped the breakfast meal, while 34%

Table 1: Socio-demographic and Anthropometric Characteristics of ND and ADY Departments' Students.

	Nutrition & Dietetics (experimental group)		Audiology (control group)		*P* value
Class years	n	%	n	%	
1st Class	53	42	38	40	0.36*
2nd Class	39	31	22	23	
3rd Class	28	22	30	32	
4th Class	5	4	5	5	
Socio-demographic Characteristics					
Years (min-max) median	(18-23) 19		20 (18-23)		<0.05**
Gender	n	%	n	%	
Female	117	94	80	84	<0.05*
Male	8	6	15	16	
City					
İstanbul	107	86	76	80	0.2*
Other	18	14	19	20	
Anthropometric Characteristics					
Body Mass Index (BMI) (kg/m²)					
Underweight (<18.5 kg/m²)	19	15	11	12	0.438*
Normal (18.5-24.9 kg/m²)	94	75	69	73	0.667*
Pre-obese (25-29.9 kg/m²)	8	6	12	13	0.111*
1st Degree Obese (30-34.99 kg/m²)	3	2	2	2	1*
2nd Degree Obese (35-39.99 kg/m²)	1	1	1	1	1*
3rd Degree Obese (≥40.00 kg/m²)	0	0	0	0	
Waist Circumference					
≥88 cm females and ≥102 cm males	15	12	8	8	0.404*
Body Fat Mass Ratio median (min-max)	23.4 (3.8-39.6)		22.60 (4.5-45.6)		0.144**
Total	125		95		

*Chi-square test was used. **Mann Whitney test was applied. (*p*<0.05 was considered statistically significant.)



*p <0.05 was statistically significant.

Graphic 1: Daily Consumption of food groups by ND and ADY Students.

(*n*=29) of ADY students (*p*<0.05). This result is consistent with several studies [22,28,33] conducted in Turkey with university students. In our study, 36% (*n*=40) of ND students and 47% (*n*=40) of ADY students indicated the highest rate of time insufficiency as the reason for skipping meals. In another study, this was found to be the highest cause of lack of time in skipping meals [22]. 94% (*n*=118) of ND students and 97% (*n*=92) of ADY students consumed snacks. ND students consume mostly dried fruits (49%, *n*=58), fresh fruits (46%, *n*=54) and

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milk-yoghurt (29%, *n*=34) respectively. On the other hand, ADY students mostly chocolate (51%, *n*=47), fresh fruit (45%, *n*=41) and biscuits (34%, *n*=31) respectively. It was observed that ND students preferred more the nuts which were healthier with statistically significant than ADY students in consuming snacks ($p<0.01$). It was found that 21% (*n*=26) of ND students and 31% (*n*=29) of ADY students consumed fast food 2-3times or more per week. The three most preferred cooking methods were found to be similar in both department students. ND and ADY students were answered respectively; baking 30% and 29%, boiling 19% and 22%; frying was 19% and 22% ($p<0.05$).

In nutritional status assessment studies, FFQ [27] and 24-h recall Food Consumption Record [27], scales were found to be good for determining nutritional habits for use in university student populations [34]. Therefore, both scales were used with the Nutrition Information System (BeBIS) and calculated with that. The data obtained using the 24-h recall Food Consumption Record are shown in Table 2 in detail and comparatively by the average values consumed for both department students. Turkey Nutrition Guide (TUBER) [35] is reported, the average individual daily energy needs 2239 kcal for men and 1786 kcal for women between the ages of 18-29 lower activity. Daily energy intake was found to be 1387 kcal (222-2773) in ND students and 1495 kcal (517-3689) in ADY students, and these values were found to be below the TUBER recommendations. When the protein intake rates of the students are examined, they are 17.2% and 17.4%, respectively in the ND and ADY departments, in accordance with TUBER recommendations (12%-20%) [35]. When the carbohydrate intake rates are examined, they are seen that ND students consume 42.7% and ADY students' rate of 43.4% and these rates are lower than the recommended range (45%-60%) [35]. Fat intake rate was found that 39.2% of ND students and 40.1% ADY students with an average of above the recommendations (20%-35%). TUBER 2016 also stated that adults can provide the daily water requirement by drinking 1500 ml-2000 ml [35]. When the average of daily water consumption is examined, it is seen that both departments do not reach these values. ND students consumed 1200 ml (200-3000) and ADY students consumed 1200 ml (200-2400) of drinking water. The daily fiber intake recommended by the European Food Safety Authority (EFSA) and also TUBER is 25 g [35,36]. ND and ADY students consumed 16 g to 17 g of fiber, respectively, and had less consumption than recommended. The recommended daily amount of potassium is 4.7g [35]. ND students consumed 1391 mg of potassium and ADY students consumed 1798 mg of potassium but remained below the recommended level ($p<0.05$). Likewise, the recommended daily amount of magnesium is 300 mg [35]. ND students consumed 159 mg of magnesium and ADY students consumed 207 mg that remained below the recommended and there was a significant difference between the two departments ($p<0.01$). The salt consuming was limited by WHO to 5 g per day [37]. As a result of the study, it was observed that ND students consumed 6.7±3.2 g and ADY students consumed 7.4±3.4 g salt. The recommended daily intake for vitamin C is 90mg [35]. ND students consumed significantly more to ADY students and approached the reference intake level ($p<0.05$).

Table 2: Nutrient Consumption of ND and ADY Students.

Nutrients	Nutrition & Dietetics (experimental group)	Audiology (control group)	*P* value
Water (ml)	1200 (200-3000)	1200 (200-2400)	0.2*
Energy (kcal)	1387 (222-2773)	1495 (517-3689)	0.257*
Protein (g)	56 (6-141)	60 (16-37)	0.140*
%	16 (7-45)	17 (6-34)	0.386*
Fat (g)	62.98±25.15	66.73±27.82	0.297**
%	40.10±8.47	39.19±8.25	0.423**
Saturated fatty acid (g)	23 (3-52)	20 (4-52)	0.196*
Monounsaturated fatty acid (g)	19 (4-59)	19 (4-37)	0.968*
Polyunsaturated fatty acid (g)	13 (2-43)	16 (2-58)	*<0.01**
C18,3 Linolenic acid (g)	1 (0-6)	1 (0-8)	0.057*
Cholesterol (mg)	208 (0-758)	190 (4-1030)	0.495*
Carbohydrate (g)	140 (18-451)	149 (30-524)	0.204*
%	43±9	43±9	0.579**
Fiber (g)	16 (3-40)	17 (6-49)	0.617*
Vitamins			
Vitamin A (µg)	739 (96-5973)	731 (151-3329)	0.497*
Vitamin E (mg)	11 (2-44)	16 (1-57)	*<0.01**
Vitamin B1 (mg)	1 (0-2)	1 (0-1)	0.768*
Vitamin B2 (mg)	1 (0-3)	1 (0-5)	0.895*
Niacin equivalent (mg)	19 (2-92)	20 (6-44)	0.260*
Vitamin B6 (mg)	1 (0-3)	1 (0-3)	0.583*
Pantothenic acid (mg)	3 (0-8)	3 (1-10)	0.797*
Total folic acid (µg)	201 (18-511)	198 (85-519)	0.903*
Vitamin B12 (µg)	3 (0-52)	3 (0-101)	0.121*
Vitamin C (mg)	83 (5-3773)	71 (6-381)	*<0.05**
Minerals			
Sodium (mg)	2619 (577-10529)	3049 (872-12697)	*<0.05**
Potassium (mg)	1391 (26-3880)	1798 (607-4169)	*<0.05**
Calcium (mg)	543 (46-1376)	531 (152-1313)	0.914*
Magnesium (mg)	159 (1-546)	207 (73-491)	*<0.01**
Phosphorus (mg)	888 (87-2244)	925 (318-1917)	0.769*
Iron (mg)	9 (1-21)	9 (3-21)	0.609*
Zinc (mg)	8 (1-20)	8 (2-23)	0.139*
Salt (g)	6 (1-17)	7 (1-24)	0.136*

*Mann-Whitney test was used. ** T-test was applied. ($p<0.05$ was considered statistically significant. $p<0.01$ was considered statistically significant).

The data obtained from the FFQ were evaluated in the I-IV food groups with reference to "Four Leaf Clover Model": (I) milk and milk products; (II) meat and products, eggs and legumes and oil seeds; (III) vegetable-fruit; (IV) bread and cereals. Food group preferences of ADY and ND students are shown in Chart I in detail. Group I Milk and dairy products were consumed by both department students every day (ND (56%, *n*= 70); ADY (57%, *n*=54). Group II covers all meat and products, eggs, legumes and oilseeds, and their daily consumption rate is 15% (*n*=19) for ND students and 16% (*n*=15) for ADY students. When the daily consumption of vegetables and fruits (Group III) was examined, it was found that ND students were 42%

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(n=53) higher than ADY students (23%, n=22) and statistically significant (p<0.005). Bread and cereals (Group IV) consume 65% (n=81) of ND students and 72% (n=68) of ADY students daily. The fact that PPS students consume more fruits and vegetables every day (Group III) shows that they have the tendency and awareness towards healthier choices. However, such a result was not seen in consumption of other groups [35].

It was found that 64(45%) of ND students and 55(58%) of ADY students in the study were doing regular physical activity. A similar result was obtained in a cross-sectional study of university students [32]. 39 students (61%) from ND students and 44 students (80%) from ADY students are doing walking regularly.

Conclusion

According to the results of the study, dietary habits of ADY students consist of unhealthy choices than ND students. Moreover, students of both departments have an inadequate-unbalanced diet patterns and not all of them have regular physical activity habits.

ADY and ND students will be among the individuals who are the future healthcare professionals and manage society. For this reason, it is recommended to include more nutrition lessons in the curriculum during the university period and to increase the incentives for healthy nutrition as well as regular physical activity. Further cross-sectional studies are needed to determine the nutritional status and physical activity of students at the Faculty of Health Sciences.

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