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Original article

Physical activity levels and eating habits of students in different educational levels

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Summary. *Aim:* People stay being healthy, they must be able to have healthy behaviors to prevent development of chronic non-communicable diseases. Because of being healthy lifestyle, individuals can acquire healthy eating habits and do physical activity regularly. This study was designed to assess physical activity levels and eating habits and its association with the health-promoting lifestyle profile of Audiology students in different educational levels. *Materials and Methods:* Total 201 male and female students were participated from Department of Audiology, Near East University, Northern Cyprus. In this study, the short form of International Physical Activity Questionnaire was applied for assessing the physical activity levels. Physical activity levels were classified as inactive, minimum active and active. Furthermore, Health-Promoting Lifestyle Profile II scale was used to determine situation of healthy lifestyles. *Results:* A statistically significant negative and weak correlation was detected between the International Physical Activity Questionnaire score and stress management score. Furthermore, a statistically significant positive and weak correlation was found between the quantity of main meals and total Health-Promoting Lifestyle Profile II score. *Conclusion:* This study showed that Health-Promoting Lifestyle Profile II subscales' scores of students influenced by their physical activity levels. Stress is one of the notable factors in healthy behavior changes. Consequently, health-promoting educational programs should be developed.

Key words: Eating habits, physical activity, life quality

Introduction

Health is a condition of complete mental, physical and social well-being. Furthermore, not only the lack of disease or disability (1). People stay being healthy, they must be able to have healthy behaviors to prevent development of chronic non-communicable diseases. Because of being healthy lifestyle, individuals can acquire healthy eating habits and do physical activity regularly (2). Unhealthy eating habits, especially meal skipping has been related with poor diet quality. As a result, there is an increased risk of obesity, diabetes and cardiovascular diseases (3). Physical inactivity has been connected with higher risk of obesity and type 2 diabetes as well (4). Many studies related to health-promoting lifestyle profiles of university students (5,6). Turkmen et al. (5) indicated that healthy lifestyle behaviors was affected by physical activity level. Furthermore, Masina et al. (6) found that association between a low intensity level of physical activity and the health responsibility and spiritual growth. Health-promoting lifestyle profiles were evaluated by the Health-Promoting Lifestyle Profile II (HPLP II). It is translated and validated in various languages (7). According to the study conducted in international students in Korea; more than half of the students had one or more cardio-metabolic risk determinants (8).

The aim of this study was to assess physical activity levels and eating habits and its association with the health-promoting lifestyle profile for acquiring the lifestyle changes in students studying Audiology at Near East University.

Materials and Methods

Participants and Measurements

This study was conducted with 44 first class (21.9%), 87 second class (43.3%) and 70 third class (34.8%) students (total 201) in the Department of Audiology at Near East University. 48.8% of the students were male (n= 98) and 51.2% were female (n= 103).

Statistical method, documentary source analysis method and descriptive method were used in this study. The data was collected from the students by face-to-face interview technique. Also, the data was collected by a questionnaire.

Health-promoting lifestyle was evaluated by HPLP II scale. HPLP II is consisted of 52 items divided into six subscales. The subscales are: stress management, health responsibility, spiritual growth, interpersonal relations, nutritional habits and physical exercise (9,10). The scale is the 4-point Likert-type. There are 4 options for each items (never, sometimes, often and routinely). The total scale score was calculated based on 52 questions. In addition, 6 subscale scores were calculated separately. As a result, the total and subscale scores were compared (9). The HPLP II scale was translated and validated to Persian, Japanese, Spanish, Turkish and Chinese versions (7). Psychometric features of the HPLP II were assessed by Malay language version (11).

Inflexible tape and portable scales were used for anthropometric measurements. Body Mass Index (BMI) classification cut-off points were used according to World Health Organization (WHO) data. BMI is commonly used to categorize the weights as underweight (<18.50 kg/m2), normal (18.50–24.99 kg/m2), overweight (25.00-29.99 kg/m2) and obese (≥30.00 kg/m2) (1).

The International Physical Activity Questionnaire (IPAQ)-short form was carried out to evaluate physical activity intensity level. It contains activities with last seven days. Short form of IPAQ includes 7 questions about at work-related, transport-related, domestic and gardening activities and leisure time activities. IPAQ-short form is developed to supply different domain-specific points for walking, moderate-intensity and vigorous-intensity activities. Calculation of the total points for all categories of activities requires sum of the duration (minutes) and frequency (days) of activity (12). Energy expenditure was computed by multiplication of the weekly frequency, duration and metabolic equivalent of the activity type. It was represented to refer to metabolic equivalent-minutes per week (MET min/week) (6). <600 MET-min per week was inactive, ≥600 MET-min - <1500 MET-min per week was minimum active and ≥1500 MET-min per week was active (12).

The study was conducted between 01.03.2018 and 01.05.2018. Students were informed about the study before the survey was applied. Ethics Committee approval was taken for this study by Near East University Health Sciences Institute Research Committee numbered 2018/62-661. Furthermore, informed consent form for student was acquired from all students. We reached the all target population.

Statistical Analysis

The statistical data analysis package program SPSS 18.0 was used. The significance level was accepted as p= 0.05. Arithmetic mean (μ), standard deviation (S), median and minimum-maximum values were established for the quantitative data. Descriptive statistics associated with qualitative variables were represented with numbers and percentages. "Kolmogorov-Smirnov" and "Shapiro-Wilk" normality tests were used to check out the normality of the data. "Pearson Chi Square" and "Fisher's Exact Chi Square" tests were executed for categorical variables. "The Student t test" was applied to compare two independent groups. "One-way ANOVA" was used to compare multiple groups. Furthermore, correlation analysis was used to evaluate the degree of association between two or more variables.

Results

Table 1 indicates the mean, minimum and maximum values of main meals by the classes and genders. According to the classes; there was no statistically significant difference about the quantities of main meals (p= 0.859). According to the genders; there was no

Table 1. The distribution of main meals by the classes and genders

Main Meal		Male	Female	Total	p2
First Class	**µ±S**	2.47±0.74	2.38±0.67	2.41±0.69	
	Median	3.00	2.00	2.00	
	Min-Max	1.00-3.00	1.00-3.00	1.00-3.00	
Second Class	**µ±S**	2.37±0.65	2.36±0.48	2.37±0.57	
	Median	2.00	2.00	2.00	
	Min-Max	1.00-3.00	2.00-3.00	1.00-3.00	
Third Class	**µ±S**	2.38±0.62	2.27±0.64	2.33±0.63	0.8592
	Median	2.00	2.00	2.00	
	Min-Max	1.00-3.00	1.00-3.00	1.00-3.00	
Total	**µ±S**	2.39±0.65	2.34±0.58	2.36±0.61	
	Median	2.00	2.00	2.00	
	Min-Max	1.00-3.00	1.00-3.00	1.00-3.00	
p1		0.4481			

[1]*The Student t test [Min: Minimum; Max: Maximum; µ: Arithmetic Mean; S: Standard Deviation]*

[2]*One-way ANOVA [Min: Minimum; Max: Maximum; µ: Arithmetic Mean; S: Standard Deviation]*

Table 2. The distribution of snacks by the classes and genders

Snack		Male	Female	Total	p2
First Class	**µ±S**	1.47±0.83	2.28±0.75	2.00±0.86	
	Median	1.00	2.00	2.00	
	Min-Max	0.00-3.00	1.00-4.00	0.00-4.00	
Second Class	**µ±S**	1.35±0.81	1.64±0.94	1.49±0.88	
	Median	2.00	1.00	1.00	
	Min-Max	1.00-3.00	0.00-4.00	0.00-4.00	
Third Class	**µ±S**	1.65±1.07	2.17±0.98	1.87±1.06	0.0062*
	Median	2.00	2.00	2.00	
	Min-Max	1.00-3.00	0.00-4.00	0.00-4.00	
Total	**µ±S**	1.49±0.93	1.97±0.94	1.74±0.96	
	Median	1.00	2.00	2.00	
	Min-Max	0.00-4.00	0.00-4.00	0.00-4.00	
p1		0.0401*			

[1]*The Student t test [Min: Minimum; Max: Maximum; µ: Arithmetic Mean; S: Standard Deviation]; *p<0.05*

[2]*One-way ANOVA [PostHoc-Tukey, Min: Minimum; Max: Maximum; µ: Arithmetic Mean; S: Standard Deviation]; *p<0.05*

statistically significant difference about the quantities of main meals by genders (p= 0.448).

Table 2 shows the mean, minimum and maximum values of snacks by the classes and genders. According to the classes; a statistically significant difference was found about the quantities of snacks (p= 0.006). A statistically significant difference was detected about the quantities of snacks by genders (p= 0.040).

Figure 1 indicates the connection between the classes and BMI classification. BMI values were evaluated by the classes; 9.1% of first class students were underweight, 56.8% of them were normal, 22.7% of them were overweight and 11.4% of them were obese. 10.3% of second class students were underweight, 58.6% of them were normal, 26.5% of them were overweight and 4.6% of them were obese. 5.7% of third class students were underweight, 71.5% of them were normal, 17.1% of them were overweight and 5.7% of them were obese. There was no statistically significant difference between the classes and BMI (p= 0.424). For this reason, the level of education had no effect on BMI.

Figure 2 explains the association of physical activity levels by the classes. Assessment of IPAQ score; 10% of first class students were inactive (<600 MET-min/week), 32.5% of them were minimum active (600-1499 MET-min/week) and 57.5% of them

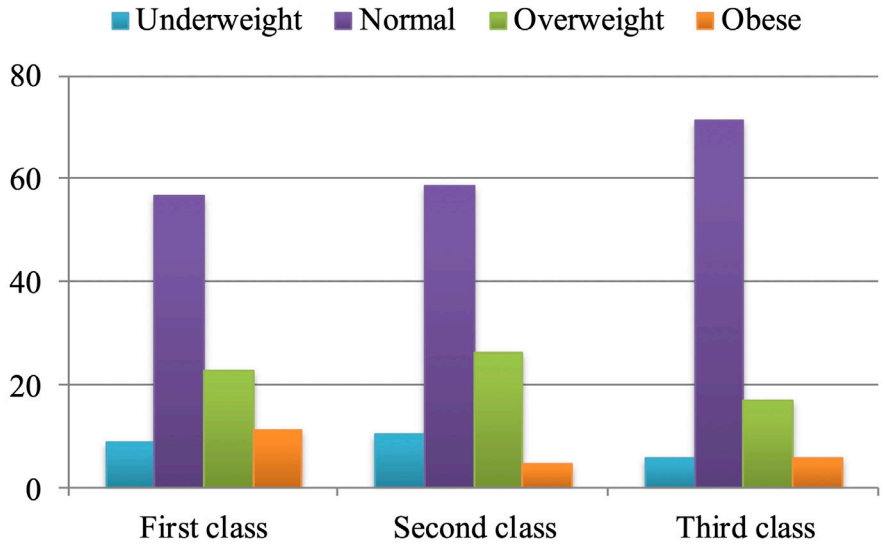

Figure 1. Connection between the classes and BMI classification

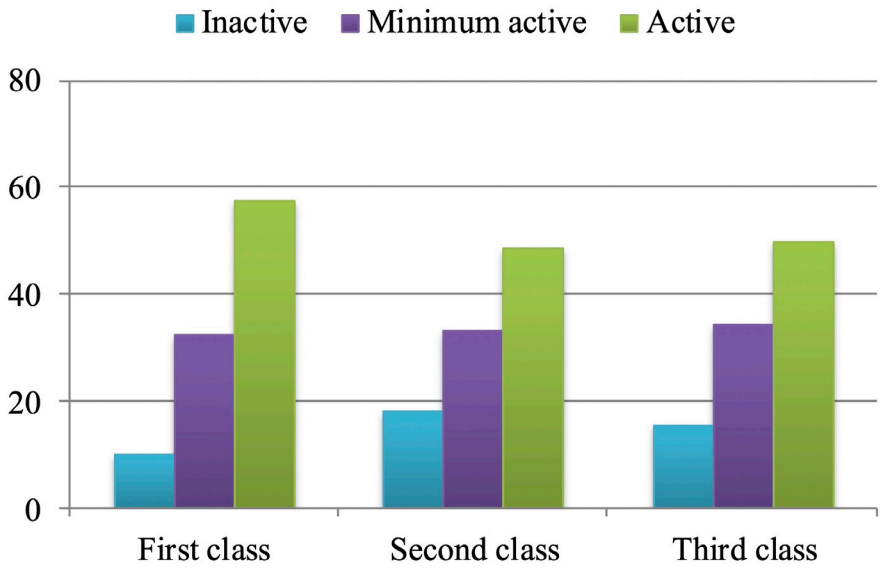

Figure 2. Association of physical activity levels by the classes

were active (more than 1500 MET-min/week). 18.1% of second class students were inactive, 33.3% of them were minimum active and 48.6% of them were active. 15.5% of third class students were inactive, 34.5% of them were minimum active and 50% of them were active. According to the results of IPAQ; there was no statistically significant difference about the classes (p= 0.819). So, there was no significant effect between the physical activity and education levels.

According to the BMI classification cut-off points; 8.5% of all students were underweight, 62.6% of them were normal weight, 22.4% of them were overweight and 6.5% of them were obese. According to the BMI values; 6.1% of male students were underweight, 51.1% of them were normal, 35.7% of them were overweight and 7.1% of them were obese. For female students; 10.7%, 73.8%, 9.7% and 5.8%, respectively. A statistically significant difference was found between females and males (p= 0.001).

According to the IPAQ values; it was determined that 13.5% of male students were inactive, 36% of them were minimum active and 50.5% of them were active. For female students; 17.3%, 30.9% and 51.8%, respectively. There was no statistically significant difference about the genders (p= 0.690).

There were total six Health Promoting Lifestyle Profile subscales. The mean score of health responsibility was 20.45±4.43, physical activity was 18.44±4.96, nutrition was 19.98±4.06, spiritual growth was 25.23±4.76, interpersonal relations was 24.68±4.17 and stress management was 19.45±3.35. The total HPLP II mean score of the students was 128.30±18.17.

A statistically significant positive correlation was found between the HPLP II score and the HPLP II subscales' scores (nutrition (r= 0.713), stress management (r= 0.740), health responsibility (r= 0.705), interpersonal relations (r= 0.679), spiritual growth (r= 0.714) and physical activity (r= 0.681)) ($p<0.05$). HPLP II subscales' scores increase as total HPLP II score increases.

A statistically significant positive and weak correlation was determined between the IPAQ score and physical activity score (r= 0.295, p= 0.000). Furthermore, a statistically significant negative and weak correlation was detected between the IPAQ score and stress management score (r= -0.159, p= 0.039).

According to the this study; a statistically significant positive and weak correlation was determined between the quantity of main meals and nutrition score (r= 0.247, p= 0.000). A statistically significant positive and weak correlation was found between the quantity of main meals and total HPLP II score as well (r= 0.189, p= 0.007). However, a statistically significant positive and strong correlation was detected between the nutrition score and total HPLP II score (r= 0.713, p= 0.000).

Discussion

The results of this study indicated a statistically significant positive and weak correlation was found between the quantity of main meals and nutrition score or total HPLP II score. Kim et al. (13) revealed that in Nutrition students, especially students were very probably to skip breakfast meal and had poor eating behavior. According to the BMI values; 62.6% of all students were normal. Similarly, a cross-sectional study was committed among Lebanese university students; more than half of them (71.0%) had a normal body weight (14).

The study which was committed at Alexandru Ioan Cuza University from Iasi, Romania on undergraduate students (n= 333); the findings showed that males were more active than females (15). On the contrary, according to the IPAQ results of the study; it was found that 50.6% of male students and 51.9% of female students were active. However, there was no statistically significant difference about the genders. According to study conducted on university students in Poland; it was found that students who had more physical activity, they had less simple carbohydrate intake such as sucrose. Additionally, they showed more careful behavior in food choices and avoided foods containing high amount of simple carbohydrate (16). In the study conducted with Brazilian undergraduate university students; it was found that physically active students consumed more fruits and vegetables,

while physically inactive students consumed more soft drinks and meat with visible fat. Thus, it was emphasized that physically active students had healthier lifestyle tendencies (17). Teixeirab et al. (18) concluded that eveningness is related with skipping breakfast meal. Breakfast skippers had excessive intake of carbohydrates, fats and calories.

According to the study in South Korea; as the sitting hours of university students increase, stress levels also increase (19). Similarly, a negative correlation was found between IPAQ score and stress management score in this study. In a study examining the relationship between physical activity and emotional intelligence; students who had higher levels of leisure-time physical activity, they had a better emotional repair. Additionally, men had more leisure-time and occupational physical activities than women (20). On the contrary, women were more active than men in this study. According to a cross-sectional study in Saudi Arabia; a significant difference was determined between students of health-related departments and students of non-health-related departments in following a planned exercise program and taking part in leisure time and physical activities. 37.8% of students in health-related departments and 35.3% of students in non-health-related departments showed that they do strength exercise for 20 minutes or longer at least three times a week (21).

Poor eating habits are related lower problem solving capacity and health are affected adversely. Poor eating habits can damage neural functions and can cause a decrease in IQ level (22). Between the brain and gut, there is a bidirectional interaction called as gut-brain axis. Therefore, healthy gut (with an adequate intake of macro- and micro-nutrients) can help mental health (23). Antony and Azeem revealed that, obesity was related with impairment in quality of life (mental and physical health problems). Furthermore, obese students had higher deterioration in social and emotional skills (24). The better quality physical activity motivations can cause healthier eating habits (25). In the United States, university students' healthy eating habits such as breakfast consumption had a positive effect on their academic performance (26).

Conclusion

There were different results considering to university year levels of students. They should be provided with education programmes to obtain healthy eating habits and modify their lifestyles. At the same time, educational seminars should be organized for university students and undergraduate curriculum should be developed in terms of healthy living. In order to protect or prevent to non-communicable chronic diseases caused by poor diet or physical inactivity, they should be monitorized routinely. This study brings into contribution to further studies about physical activity levels and eating habits of various university students in different cultures.

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Conflicts of Interest

No potential conflict of interest relevant to this article was reported by the authors.

Ethical Standards and Informed Consent

Ethics Committee approval was obtained for this study from the Near East University Health Sciences Institute Research Committee numbered 2018/62-661. Furthermore, informed consent form was acquired from all participants.

Author Contributions

M Hoca and G Özduran originally designed the study. M Hoca and G Özduran together wrote

the initial draft of the manuscript. M Hoca and G Özduran critically reviewed and evaluated the results.

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