PRINT: ISSN 0972-0073 ONLINE: ISSN 2456-6802
Anthropologist, 19(1): 145-156 (2015)
DOI: 10.31901/24566802.2015/19.01.17

Comparison of Body Composition, Cardiovascular Fitness, Eating and Exercise Habits among University Students

Ani Agopyan

Department of Trainer Education, School of Physical Education and Sports, Marmara University, Istanbul, Turkey

KEYWORDS Blood Pressure. Heart Rate. Anthropometry. Food Habits. Physical Activity

ABSTRACT The present research aimed to compare the fitness parameters, nutritional patterns and exercise habits of students among School of Physical Education and Sports with regard to gender and three different departments. A total of 333 students (Trainer Education n=100, Physical Education and Sport Teaching n=90, and Sports Management n=150) participated in this research. Cardiovascular (CV) parameters, anthropometric and body composition measurements were taken. Analysis did not reveal significant department and gender interaction effects in terms of all parameters ($p>0.05$). Most of features were significantly different ($p>0.05$) between the genders, as expected. Exercises habits parameters were statistically ($p<0.05$) lower and CV parameters were slightly higher for the students in Sports Management program than that of other departments. As a conclusion, although there were some differences between the departments and gender,fitness properties, nutritional patterns and exercise habits values of male and female participants were generally within a healthy profile.

INTRODUCTION

Body composition, cardiovascular fitness, dietary and exercise habits contribute significantly to a healthy lifestyle and lower the risks for major chronic diseases (Pischon et al. 2008). Nevertheless, unhealthy dietary habits including irregular meals and unhealthy snacking (Spanos and Hankey 2010) along with low physical activity (Mozaffarian et al. 2012) have become increasingly prevalent worldwide. Aforementioned parameters and habits should ideally be established during childhood. Secondly, the university could bean ideal context in which to learn and consolidate students' personal and professional lifestyles for the future health (Romagueraet al. 2011). Information about health-related factors and early intervention among university students are important aspects in establishing targeted strategies and promoting lifestyle changes for preventing diseases. Comprehension of this kind of knowledge could help create more targeted strategies for preventing unhealthy life style for public health officials.

Address of correspondence:
Dr. Ani Agopyan
Marmara Universitesi, Beden Egitimi ve Spor Yüksekokulu, Anadoluhisari Yerleskesi, Cuma yolu cad., 34800 Beykoz, Istanbul /Turkey
Telephone: +90 216 308 56 61
Fax: + 90 216 332 16 20
E-mail: aniagopyan@marmara.edu.tr

There have been several worldwide publications in recent years on the body composition variables (Moraes et al. 2014; Zaccagni et al. 2014) and physical activity (Keating et al. 2005; Zaccagni et al. 2014), obesity and anthropometric indices (Peltzer et al. 2014; Sengupta et al. 2014), dietary intake patterns (Salameh et al. 2014),habitual meal and snacking patterns (Spanos and Hankey 2010), eating behaviors (Nmor et al. 2014), risk factors and diseases (Desouky et al. 2014; Ibrahim et al. 2014; Tadese and Alemu 2014) in university students. As a summary, studies have explained that the low physical fitness level, unhealthy dietary pattern and some health risks have increased among university students. In a meta-analysis (Keating et al. 2005), it has been indicated that about 40–50% of college students are physically inactive.Therefore, preventive measures, such as increasing awareness and early screening for the disease in young adults warranted (Tadesse et al. 2014).

Health related behavioral changes of university students of different academic disciplines (Martínez-Lemos et al. 2014) were influenced by a variety of factors, including according to age, gender, ethnicity (Spanos and Hankey 2010). If ethnicity has an impact on health related behavioral changes of students, Turkish students' fitness parameters should be evaluated separately. Besides, results indicated that the increase in the prevalence of irregular eating (Tozun et al. 2010) and low levels of participation in physical activities (Arabaci et al. 2012) were becoming a

significant public health problem among Turkish university students. Hence, special attention should be given to preventative measures related to male and female university students in Turkey, and further researches should be carried out. But this issue has not yet been adequately researched with a wide spectrum ina specific population such as Physical Education and Sports departments' students who are supposed to be physically active.Ozdogan and Ozcelik (2011) only have been evaluated the nutrition knowledge of sports department students in Turkey. Also, in the recent years, limited number of studies has been conducted on estimating the health related habits among physical education and sports departments' students in the literature (Ansah et al. 2014; Franzki et al. 2013; Zaccagni et al. 2014). Despite of a greater percentage of elite athletes, German sport students do not report behavior associated with eating disorders more frequently than students with other majors (Franzki et al.2013).In addition, it has been observed that many physical education students demonstrated in many unhealthy habits that need attention (Ansah et al. 2014). So such studies are urgently needed.

Further, School of Physical Education and Sports (SPES) which are the academic units that give service in the area of healthy living are highly preferred by university students in Turkey. The SPES may have three different departments: Physical Education and Sport Teaching (PEST), Trainer Education (TE) and Sport Management (SM). The students in the department of SM who have mostly theoretical classes are not expected to have sports background. It was presumed that the students' previous sports experience may have an impact on their daily life habits in different ways. Students of physical education and sports departments should be educated in a multidirectional manner and be good role models for the community. In addition, it is important to evaluate fitness parameters, nutritional patterns and exercise habits of students who will serve in the physical education and sports field. On the other hand, it is remarkable that there is no available versatile research about health related parameters of Physical Education and Sports students in Turkey.

Objectives

The present research aimed to compare the exercise habits, cardiovascular fitness, nutritional patterns, anthropometric and body composition characteristics of university students with regard to gender and departments; Trainer Education, Physical Education and Sport Teaching and Sports Management in the SPES.

METHODOLOGY

Participants

A total of 333 (133 female, 200 male) students from three different departments at the SPES in *Marmara University, Istanbul- Turkey* aged between17-39 (21.51±3.51 years) voluntarily participated. The participants were from the departments of Trainer Education (n_{women} = 67, n_{men}=117), Physical Education and Sport Teaching (n_{women} = 30, n_{men}= 46) and Sports Management (n_{women} = 36 women, n_{men}= 35 men) and using the same facilities in the campus. All participants presented normal motor function without any neurological, motor or eating disorders. Before the research began, the volunteers signed an informed consent form. The research was conducted in agreement with the Declaration of Helsinki. The experiment was approved by the *Ethical Committee of Marmara University Institute of Health Sciences* (27.02.2014/12).

Data Collection

Each participant visited the laboratory once. The tests were completed in a single session at the same time of the day (10 AM to 1 PM). Necessary precautions were taken to prevent the influence of environmental factors such as noise and temperature (21ºC ± 2ºC). The students were requested not to attend any activity and to be in a resting condition on test days and avoid drinking or eating at least 4 hours before measurements. The following tests were performed respectively: completed questionnaire, measurements of resting heart rate, systolic and diastolic blood pressures, anthropometric measurements and analyses of body composition.All test measures were conducted by specialists (AA) who had a degree in kinanthropometry with certification.

Measures

Demographic Questionnaire

Participants completed a questionnaire form designed specifically for this research. The first section of the form consisted of participants'

demographic data including date of birth, gender, department, and class. Second section included training habits (hours per day and week), habitual meal patterns and snack intakes to assess the frequency of breakfast, mid-morning snacking, lunch, mid-afternoon snacking, dinner and evening snacks consumed in the last one month (yes or no).

Resting Heart Rate and Blood Pressure

Resting heart rate and blood pressure were measured using the FT-500R automatic device (Jawon Medical, Korea), which uses the cuff-oscillometric method to generate a digital display of systolic/diastolic blood pressure and resting heart rate. This device is an automated electronic monitor, which is connected to the computer and the measurements are done using an upper arm cuff. The participants were asked to sit quietly, relax and refrain from moving or talking during the rest period for 5 minutes before the measurements. During the measurements, the participants sat upright in a comfortable chair, relaxed with both feet on a flat surface with their arms resting on the table. The right arm was positioned with the palm facing up. All measurements were performed twice and calculated by taking the average of the first and second set (five minutes apart). Blood pressure was reported in millimeters of mercury (mmHg) and heart rate was reported in beat of per minutes (bpm). The lower limits of hypertension are 140 mm Hg for systolic and 90 mmHg for diastolic BP using The Joint National Committee guidelines (Chobanian et al. 2003). The normal resting heart rate range was considered 60-100 beats/min (Mitka 2010).

Anthropometric Measurements and Evaluations

The anthropometric measurements included height, body mass, waist circumference (WC) and hip circumference according to the Anthropometric Standardization References Manuel protocol (Lohman et al. 1988). The participants wore light clothing without shoes. Body height, waist circumference and hip circumference (nearest 0.1 cm) were measured in a standing position with a Gulick measuring tape (model J00305, Lafayette Instrument, U.S.A.). Body mass (kg) was measured to the nearest 0.1 kg on an X-scan body composition analyzer (Jawon Medical, Korea). WC was taken at the end of normal expiration and at the level of the mid-point between last floating rib and top of iliac crest in the mid-axillary line. Hip circumference was measured at the level of the symphysis pubis and the greatest gluteal protuberance. Waist to hip ratio (WHR) was calculated by taking the WC (cm) and dividing by the hip circumference (cm) it was calculated as a measure of regional fat distribution (Alberti et al. 2005). Body Mass Index (BMI), was calculated by dividing body weight (kg) by the square of the height (m^2). BMI, waist circumference, and WHR were categorized to define the degree of obesity according to the international criteria (Alberti et al. 2005). Based on BMI, participants were classified as underweight (less than 18.5 kg/m^2), normal weight (18.5 to 24.9 kg/m^2), overweight (25 to 29.9 kg/m^2), obesity class I, (30 to 34.9 kg/m^2), obesity class II (35 to 39.9 kg/m^2), and obesity class III ($\geq$ 40 and more kg/m^2) (WHO, 2010). Based on WC, participants' health risks were classified according to the International Diabetes Federation consensus defining central obesity in Europids as low (a WC less than 80 cm in females; less than 94 cm in males), increased (80 to 87 cm in females; 94 to 101 cm in males) or high (more than 87 cm in females; more than 101 cm in males) (Alberti et al. 2005). The clinical criteria for normal ($\leq$1.0 for men and $\leq$0.85 for women) and central obesity (>1.00 for men and >0.85 for women) were selected according to the cut-offs for WHR (WHO 1999).

Body Composition

Body composition was evaluated by a multifrequency bioelectrical impedance analysis (BIA) device (X-scan body composition analyzer, Jawon Medical, Korea) with tetra polar electrodes. Participants' age and gender data were entered into the BIA machine. Body-composition measurements were performed with participants being barefoot, in light clothing, after a 4-hr fast from food and fluid, and having avoided alcohol consumption in the previous 24 hrs and participation in intensive exercise in the previous 12 hrs. As a result of body composition analysis, the values of percent body fat (%), body fat mass (kg) and lean body mass (kg) were taken into consideration. Normal range for percent body fat was considered as follows: 10–22% for males and 20–32% for females (Lohman 1982).

Statistical Analysis

Descriptive statistics for continuous and binary variables were used to summarize the data by gender and departments. The differences between departments and genders were analyzed by using two way analysis of variance (ANOVA). In case of significant F value, Tukey's post-hoc analyses were performed. When main or interaction effects resulted in significant differences, the effect size using the eta squared (η^2) were computed. The effect size scores were evaluated according to values which were explained an effect size of 0.8 is large, 0.5 is medium or moderate, and 0.2 is small (Thalheimer and Cook 2002). Chi-square tests were used to test differences in the binary variables including exercise habits, habitual meal patterns and snack intakes between three departments for males and females. Logistic regression analysis was also performed to analyze effects of both departments and gender on the binary variables. All statistical analyses were performed with SPSS version 14.0 (SPSS Inc., Chicago, IL, USA), or statistical analysis system (SAS) (Cary, NC: SAS Institute Inc., 2002-2010). $P<0.05$ was considered to be statistically significant.

RESULTS

All continuous parameters were reported as mean and standard deviations (SD) and presented according to the departments and gender with statistical testing results from two way ANOVA and Chi-square tests.

Differences in Descriptive Results and Exercise Habits

The general characteristics and training profiles of the university students are shown in Table 1.Analysis did not indicate significant differences for department, gender and department x gender interaction effects on age variable (Table 1). Also, analysis did not reveal significant department x gender interaction effects for sport experience, training time or training hours per week (Table 1). On the other hand, sports experience, training frequency and training hours per week were significantly different among three departments ($p<0.05$). Students from TE and PEST had much more sports experience and training hours per week than students of SM ($p<0.0001$). Also, students from TE had much more frequency training per week than students of SM. Compared to female students, male students had slightly longer sports experience, training frequency and training hours per week but these differences were not statistically significant ($p>0.05$). Further, chi-square analysis indicated significant differences in the percentage of exercise participants among three different departments for both genders. The percentage of exercise participation for male and female students were higher in TE than SM department ($p<0.05$). The percentage of male and female students who exercise regularly were 82.6% and 76.7% in TE, but these values were 71.4% and 55.6% in SM, respectivly. Further, ANOVA results indicated significant differences in sport experience, training time or training hours per week participation among students in the three different departments favoring students in TE ($p<0.05$). TE students exercised more frequently and longer than males and females in SM 1department.

Differences in Anthropometric and Body Composition Parameters

Anthropometric and body composition parameters of male and female students in three different departments are shown in Table 2.Analysis did not reveal significant department x gender interaction effects in terms of anthropometric and body composition parameters. Also, all interactions are not significant ($p>0.05$) for the gender differences between departments.On the other hand, all the anthropometric and body composition parameters were significantly different between male and female students (Table 2). Male students had higher means than females in all the parameters except percent body fat($p<0.001$). Further, there was a significant difference in hip circumferences among three departments ($p<0.001$). Students in TE department had a higher hip circumference than those in PEST.

Differences in Cardiovascular Parameters

The analyses of cardiovascular parameters were shown in Table 3.Analysis did not reveal department x gender interaction effects for resting heart rates, systolic and diastolic blood pressures ($p>0.05$). But, ANOVA (2 x 2) results indi-

Table 1: General characteristics and training profiles of male and female university students

Variables	*Departments*	*Male*		*Female*		*Two way Anova*					
						Departmente ffect		*Gender effect*		*Interaction*	
		n	*Mean±SD*	*n*	*Mean±SD*	*F*	*p*	*F*	*p*	*F*	*p*
Age (Years)	TE	119	22.74±2.99	67	22.06±3.21	0.03	0.9739	2.06	0.1527	0.54	0.5838
	PEST	46	22.96±3.15	30	22.00±2.30						
	SM	35	22.46±2.38	36	22.50±3.66						
	Total	200	22.74±2.92	133	22.17±3.15						
Sports	TE	119	10.63±3.77	67	9.94±4.20	15.50	0.0001*	2.01	0.1571	0.27	0.7662
Experience	PEST	46	9.78±3.16	46	8.62±3.69						
(Years)	SM	35	7.29±3.95	35	7.08±5.06						
	Total	200	9.85±3.86	133	8.87±4.48						
Training	TE	95	4.80±2.74	50	3.93±1.95	4.51	0.0119*	0.55	0.4600	1.37	0.2569
Frequency	PEST	38	3.97±1.90	23	4.09±1.81						
per Week	SM	25	3.20±1.32	20	3.25±1.37						
(Times)	Total	158	4.35±2.44	93	3.82±1.82						
Training	TE	95	9.28±7.46	50	8.32±7.17	6.63	0.0016*	0.54	0.4647	0.04	0.9580
Hours per	PEST	38	8.43±5.56	23	8.07±5.83						
Week	SM	25	5.16±2.94	20	4.45±2.31						
(Hours)	Total	158	8.42±6.64	93	7.43±6.25						

TE: Trainer Education; PEST: Physical Education and Sport Teaching; SM: Sport Management; SD: Standard Deviation. *p<0.05.

Table 2: Anthropometric and body composition parameters of male and female university students

Variables	*Departments*	*Male*		*Female*		*Two way Anova*					
						Department effect		*Gender effect*		*Interaction*	
		n	*Mean±SD*	*n*	*Mean±SD*	*F*	*p*	*F*	*p*	*F*	*p*
Anthropometric	TE	119	179.46±7.84	67	167.44±8.36	2.90	0.056	179.43	0.0001*	0.53	0.586
Measurements	PEST	46	178.55±7.28	30	166.88±5.43						
Height(cm)	SM	35	177.86±7.70	36	163.83±7.79						
	Total	200	178.97±7.68	133	166.34±7.74						
Body Mass (Kg)	TE	119	76.01±10.12	67	61.41±10.10	2.67	0.070	183.52	0.0001*	1.24	0.291
	PEST	46	74.21±9.59	30	57.86±6.52						
	SM	35	75.64±12.58	36	56.61±9.94						
	Total	200	75.53±10.45	133	59.31±9.55						
BMI(kg/cm²)	TE	119	23.61±2.76	67	21.80±2.34	1.79	0.168	53.11	0.0001*	0.91	0.402
	PEST	46	23.25±2.47	30	20.78±2.22						
	SM	35	23.78±2.51	36	21.07±3.10						
	Total	200	23.55±2.65	133	21.37±2.56						
Waist Circum-	TE	119	81.24±6.58	67	71.53±6.35	2.37	0.095	168.34	0.0001*	0.92	0.399
ference(cm)	PEST	46	79.86±5.71	30	69.26±4.72						
	SM	35	81.00±8.38	36	68.64±7.75						
	Total	200	80.87±6.75	133	70.22±6.49						
Hip Circum-	TE	119	101.05±4.86	67	93.71±6.86	2.69	0.0699	137.33	0.0001*	0.72	0.485
ference(cm)	PEST	46	99.95±4.77	30	91.85±4.32						
	SM	35	99.66±6.46	36	90.36±6.04						
	Total	200	100.53±5.18	133	92.39±6.23						
Waist-Hip-Ratio	TE	119	0.81±0.04	67	0.77±0.04	1.00	0.370	87.53	0.0001*	0.94	0.392
	PEST	46	0.80±0.04	30	0.76±0.03						
	SM	35	0.81±0.05	36	0.76±0.04						
	Total	200	0.81±0.04	133	0.76±0.04						
Body Compo-	TE	119	60.33±5.77	67	45.74±5.88	2.71	0.068	479.61	0.0001*	0.41	0.661
sition	PEST	46	59.66±5.97	30	44.35±3.18						
Lean Body	SM	35	59.25±6.99	36	43.23±5.08						
Mass(kg)	Total	200	59.99±6.03	133	44.75±5.24						
PercentBody	TE	119	20.18±4.61	67	25.01±4.30	2.76	0.065	39.13	0.0001*	2.56	0.079
Fat(%)	PEST	46	19.26±4.07	30	22.95±4.65						
	SM	35	21.02±4.93	36	22.97±4.99						
	Total	200	20.11±4.56	133	23.99±4.66						
Body Fat Mass	TE	119	15.67±5.38	67	15.67±4.91	2.60	0.076	4.48	0.0351*	2.09	0.126
(kg)	PEST	46	14.55±4.56	30	13.51±4.10						
	SM	35	16.39±6.33	36	13.38±5.67						
	Total	200	15.54±5.39	133	14.56±5.05						

TE: Trainer Education; PEST: Physical Education and Sport Teaching; SM: Sport Management; BMI= Body Mass Index. SD: Standard Dviation *p<0.05.

Table 3: Physiological characteristics of male and female university students

Variables	*Departments*	*Male n*	*Male Mean±SD*	*Female n*	*Female Mean±SD*	*Two way anova: Department effect F*	*Department effect p*	*Gender effect F*	*Gender effect p*	*Interaction F*	*Interaction p*
Systolic Blood Pressure (mmHg)	TE	119	122.26±13.78	67	107.57±16.00	1.17	0.311	57.59	0.0001*	1.37	0.255
	PEST	46	119.26 ±11.53	30	110.32±10.28						
	SM	35	120.00 ±12.44	36	103.88±19.18						
	Total	200	121.18±13.08	133	107.19±15.94						
DiastolicBlood Pressure (mm Hg)	TE	119	67.82±8.03	67	64.15±8.52	2.30	0.101	13.24	0.0003*	0.50	0.607
	PEST	46	66.58±8.06	30	64.13±7.21						
	SM	35	66.04±7.46	36	60.78±11.82						
	Total	200	67.22±7.94	133	63.22±9.34						
Resting Heart Rate(bpm)	TE	119	73.29±12.94	67	77.53±11.65	5.11	0.006*	5.23	0.0228*	0.71	0.494
	PEST	46	71.29±11.35	30	72.13±10.70						
	SM	35	75.67±16.11	36	81.30±11.61						
	Total	200	73.25±13.22	133	77.20±11.79						

TE: Trainer Education; PEST: Physical Education and Sport Teaching; SM: Sport Management; SD: Standard Deviation *p<0.05.

cated that gender differences were found significantly (p<0.05) in systolic and diastolic blood pressures and resting heart rates of the participants. Female students had lower means than males in terms of both systolic and diastolic blood pressures. However they had higher means in resting heart rates than that of male students. Furthermore, two way ANOVA revealed significant differences in resting heart rate among departments (p<0.05). Student from SM department had resting slightly higher heart rate than students from TE and PEST departments. Students from PEST departments had the lowest resting heart rates.

Differences in Eating Habits

The frequencies and logistic regression analysis results of habitual meal patterns and snack intakes of male and female students in three different departments are shown in Table 4.There were no significant (p>0.05) interaction effects between gender and department in habitual meal patterns (breakfast, lunch, dinner and all snacks). The consumption frequencies of main meals of male and female students did not differ with regard to departments (p>0.05). Most of the male and female students in three departments consumed the main meals - breakfast, lunch and dinner frequently. Consumption frequencies of mid-morning, mid-afternoon and evening snacks in both groups were less than main meals. Furthermore, chi-square analysis indicated significant differences in the percentage of mid-afternoon snacking among three different departments for females (p<0.05).The percentages of mid-afternoon snacking (Table 4) for female students were higher (66.7%) in SM than TE (36.7%) and PEST (41.8%) students (χ^2=0.022; p<0.05).

DISCUSSION

In the light of literature, the current paper is the first versatile research to compare the exercise habits, cardiovascular fitness, nutritional patterns, anthropometric and body composition characteristics of SPES students with regard to gender and departments in Turkey. There are few studies (Franzki et al. 2013; Ansah et al. 2014; Zaccagni et al. 2014) that have been investigating health related parameters and life habits of university students in physical education and sports department of different nations. On the

Table 4: The habitual meal patterns and snack intakes by department and gender

Variables	*Departments*	*Male*		*Female*		*Logistic model*					
						Department effect		*Gender effect*		*Interaction*	
		n	*N (%)*	*n*	*N (%)*	*F*	*p*	*F*	*p*	*F*	*p*
Breakfast (Yes)	TE	119	100(84.0)	67	55 (82.1)	0.49	0.783	0.12	0.732	0.07	0.967
	PEST	46	37 (80.4)	30	23 (76.7)						
	SM	35	29 (82.9)	36	28 (77.8)						
	Total	200	166 (83.0)	133	106 (79.7)						
Mid-morning	TE	119	26 (21.8)	67	19 (28.4)	0.88	0.644	0.99	0.320	0.60	0.742
Snacking(Yes)	PEST	46	6 (13.0)	30	8 (26.7)						
	SM	35	9 (25.7)	36	13 (36.1)						
	Total	200	41 (20.5)	133	40 (30.1)						
Lunch (Yes)	TE	119	111 (93.3)	67	60 (89.6)	0.43	0.806	0.79	0.374	1.12	0.571
	PEST	46	43 (93.5)	30	26 (86.7)						
	SM	35	31 (88.6)	36	33 (91.7)						
	Total	200	185 (92.5)	133	119 (89.5)						
Mid-afternoon	TE	119	57 (47.9)	67	28 (41.8)	7.28	0.056	0.64	0.422	7.22	0.057
Snacking (Yes)	PEST	46	21 (45.7)	30	11 (36.7)						
	SM	35	13 (37.1)	36	24 (66.7)						
	Total	200	91 (45.5)	133	63 (47.4)						
Dinner (Yes)	TE	119	115 (96.6)	67	59 (88.1)	2.38	0.304	4.62	0.051	2.31	0.315
	PEST	46	45 (97.8)	30	28 (93.3)						
	SM	35	33 (94.3)	36	35 (97.2)						
	Total	200	193 (96.5)	133	122 (91.7)						
Evening Snack	TE	119	45 (37.8)	67	16 (23.9)	5.08	0.079	3.72	0.053	7.00	0.051
(Yes)	PEST	46	14 (30.4)	30	13 (43.3)						
	SM	35	9 (25.7)	36	15 (41.7)						
	Total	200	68 (34.0)	133	44 (33.1)						

TE: Trainer Education; PEST: Physical Education and Sport Teaching; SM: Sport Management.

other hand, comparison of the results of these researches could have been affected by the culture. That's why generalization and comparison of cross cultural studies should be done with care.

One of the main findings of this research displayed that the exercises habits (sports experience, training frequency and training hours per week) of university students were significantly different among three departments of SPES. On the other hand, gender differences could not be found. Participation percentage in physical activities of the female (55.6%) and male (71.4%) students in SM department was less than the students in other departments as expected. Most of the students in the SM department were not registered athletes prior to their enrollment and have mostly theoretical classes, which might be the underlying some of the reason for these results. In addition, that may cause the low participation percentage in physical activities especially for the female students in SM department.

On the other hand, availability of facilities in university does not differ between departments. Although there is some definite time for the students in order to use the facilities, it is speculated that they do not have enough time outside owing to busy lecture schedules, and may be too tired to engage in extra physically activities (Ansah et al. 2014). The results of the studies that had been done with physical education and sports students (Ansah et al. 2014; Zaccagni et al. 2014) did not divide their participants according to departments. That makes impossible to compare the results of these studies with the results of the present paper. On the other hand, if the participants of this research has been considered as a university students, they were physically active compared to the other University students in Turkey (Dorak 2002; Daskapan et al. 2006; Arabaci et al. 2012) and the other countries like Australia, United Kingdom and Saudi Arabia (Irwin 2004; Dodd et al. 2010; Desouky et al. 2014). This result can be attributed to the fact that students were in physical education and sports departments and had an existing positive attitude towards maintaining a healthy lifestyle. It can also be said that the health and physical activity courses they took during their undergraduate education had benefited them.

Despite these differences, most of the students participate to physical activities at least 4-9 hours and 3to 4 times a week. It could be the reason for similar results on the formation of anthropometric and body composition parameters. That idea has been supported by the findings of Zaccagni et al. (2014). According to them, high levels of physical activity can be useful in maintaining desirable body composition.

Another finding of this study revealed that there were differences in anthropometric measurements and body composition parameters between genders, with males having higher height, body mass, BMI, waist circumference, hip circumference, waist hip ratio, lean body mass and body fat mass. The present findings are similar to the researchers conducted among university students from seven European countries (Mikolajczyk et al. 2010) and on School of Sport Science students (Zaccagni et al. 2014).The present results are in same line with the previous investigations (Geer and Shen 2009; Zaccagni et al. 2014) indicating that males have greater total lean body mass and lower percent of body fat than females. As reported by Geer and Shen (2009) differences in anthropometric and body composition parameters between males and females could be a result of the sex hormones which begins early in life and strengthened during puberty (Power and Schulkin 2008). The current research did not attempt to identify these potential variables. Another possible explanation for difference is that men have more skeletal muscle than women and the lower physical activity expenditure in women may be at least partly explained by body composition differences (Geer and Shen 2009).

Body composition assessment is used to verify the health status of the population in general (Zaccagni et al. 2014). In both cross-sectional and prospective studies, it has been reported that indices of abdominal obesity first WHR and then WC have increasingly been associated with higher cardiovascular risk in recent years (Ashwell 2012). Also, BMI provides a measure of obesity, and is a predictor of fatness-related health risks and can be used when planning workplace intervention programs (Mooney et al. 2013; Huang et al. 2014). Although, the majority of male and female students were classified within the normal range of the BMI and WHR, the average of WC values was low according to the classification of World Health Organization (WHO 1999) which indicated that they did not have central obesity. The BMI results were consistent with the findings of Ara-

baci et al. (2012). Also, students' BMI and the WC values of this research were similar to that of values of the students in the school of sport science in Italy (Zaccagni et al. 2014).

Some of the important risk factors for CV disease are the high blood pressure, high resting heart rate and percent body fat (Ibrahim et al. 2014; WHO 2013). It is remarkable that an alarmingly high prevalence of different CV disease risk factors revealed among university students (Ibrahim et al. 2014;De Moraes et al. 2014). But in the present paper, almost all female and male students in three departments of the SPES had normal values of blood pressure, resting heart rates and percent body fat, which is an important finding as it is an indication a healthy generation low cardiovascular disease risk towards. Only, 7.5% of the male students had systolic hypertension issues. This finding is similar to the research reported that about 7.4% of Ethiopian university students had hypertension (Tadesse and Alemu 2014). On the other hand, percent body fat values of male students in the present paper were higher, while the values of female students were lower compared to Italian School of Sports Science students (Zaccagni et al. 2014).

Another finding of this paper revealed that there was no significant interaction of gender and department in CV parameters. On the other hand, the main effects analysis showed that CV parameters did differ with regard to departments and also between genders. Female students had lower means than males in both systolic and diastolic blood pressure but they had higher means in resting heart rates than male students. This is in agreement with the report by Hart et al. (2009) that in general, men possess higher BP levels (either systolic or diastolic BP) than females. Also, adolescent and adult heart rates were found to be significantly higher in women than men (Ostchega et al. 2011). Analyses of present results of resting heart rate were supported by Ostchega et al. (2011). One possible explanation for this finding is that the contribution of vasoconstrictor tone to arterial pressure regulation differs in women and men (Hart et al. 2009). Another explanation might be that the blood pressure levels of a population have been seen to be influenced by a variety of biological, behavioral and socio-economic factors such as long-term stress, high salt intake, adiposity, socio-economic status and genetic susceptibility (Wang et al. 2006). The results on CV fitness also indicated differences in resting heart rate among three departments. Student from SM department had slightly higher heart rates than students from TE and PEST departments. There might be several reasons for this. The physiological response to exercise is dependent on the intensity, duration and frequency of the exercise as well as the environmental condition. When physical activity was evaluated, SM department students had less sports experience and training hours per week than students of TE and PEST departments. Many changes occur in the cardio-respiratory system, leading to an improved ability to deliver oxygen to working muscles, more efficient energy production and a greater ability to remove waste products.

It is well known that poor eating habits in the youth can cause health problems throughout life (Zarrazquin et al. 2014). The three main meals are important. Snacks can also contribute significantly to total energy intake. Frequent snacking and/or consuming fried foods can adversely affect students' health considering the abundance of energy dense and high-fat ingredients these foods contain (Yahia et al. 2008). In this aspect, the present research aimed to examine the eating habits of the university students. The results of eating habits demonstrated that university students consumed three main meals frequently but snacking consumption was low and there were no significant differences among departments or genders. In the present paper, the way of food consumption was in line with the research reported by Ozdogan et al. (2010) but the percentage of the students who had three meals per day was higher than the previous research(45.5%). Dinner was the most and breakfast was the least consumed meal, which is consistent with those reported by Harvey et al. (2011). Gan et al. (2011) reported that the majority of Malaysian University students (73.8% males and 74.6% females) skipped at least one meal daily and breakfast was the most frequently skipped meal. Although breakfast was consumed less compared to the other two meals, it is important for SPES students whose participation percentage in physical activities is high, to have this meal regularly. The results show the awareness among the students of the SPES towards breakfast being the most important meal of the day and should not be skipped.

This present research had several limitations. The small sample was limited to only one urban

university in Turkey. The exercise habits and eating pattern were assessed by self-reporting measures. The daily or weekly food intakes of the students were not evaluated in the present paper. Taking these limitations into consideration, future research needs to be designed so that studies can be conducted with larger student populations from different universities and regions in Turkey. Future studies should include full scales for each concept to be assessed.

CONCLUSION

In conclusion, the present research confirms that the Physical Education and Sports students in three different departments (Trainer Education, Physical Education and Sport Teaching and Sports Management) have an active lifestyle including regular weekly physical activity and nutritional patterns within a healthy range according to their body compositions and cardiovascular characteristics although there were some differences between the departments and gender.

RECOMMENDATIONS

These results can be taken into consideration while designing educational programs and interventions. Further studies geared towards young adults are needed for the comprehensive assessment of nutritional and physical fitness patterns in order to examine qualitative changes in dietary habits, evaluation of nutritional knowledge, estimation of portion size, physiological characteristics and exercise habits of university students. Future researches should determine the differences of fitness parameters, eating and exercise habits of physical education and sports students between first year vs. last year students in different departments.

ACKNOWLEDGMENTS

The author would like to thank *Marmara University, School of Physical Education and Sports* students who participated in this research.

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