The relationship between body composition and diatary habits in the university faculty members

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Abstract

The aim of this study was to determine the relationship between eating habits and body composition of the university personnels. The sampling of this research consisted of academic and administrative personnels from the university (68 female and 124 male personnels). Body weight and composition were measured with a Tanita instrument. Data were collected by performing a questionnaire including 33 items. For the statistical analysis, frequency and percentage (%) distributions, Chi-Square test and Pearson correlations were used. For females, 38.9% of the university members, 30% of the instructors and 32.5% of the administrative personnels and for men, 31.6% of the university members, 38.5% of the instructors and 27.2% of the administrative personnels had two meals in a day. Both female and male administrative personnels had more junk food consumption than the others. In this study, there was more fat milk/yogurt consumption that was correlated with body composition parameters in the female university members (p<0.05). This study showed that the participants generally had unhealthy lifestyles and the critical values in waist circumferences and hip circumferences, waist-height ratio, and waist-hip ratio from body composition parameters. Because of this, healthy lifestyles-associated behaviors (exercises, physical activities, dietary habits and responsibilities of health, e.g.) must be developed among the university faculty members and other employees.

Keywords: Body composition, eating habits, university employees.

INTRODUCTION

For taking nutrition, growing up, keeping on life and protecting health, necessary foods are required (5). Nutrition is both a physiological and psychosocial event and varies under many factors (16). Work life plays highly important roles in eating style and individuals' working conditions affect their health (9). Many factors such as types of works, workplace, working environment, work load, etc. are effective in the development of eating pattern (13). Work intensity and its related stress have impacts on individuals' nutrition (24). When personnels do not eat properly and keep a balanced diet, their health gets worse, their resistance to diseases reduce, their attention decreases, their movements slow down, their absence from work increases, required

productivity is not given and production goes down. Personnels' nutrition problems are resulted in workday losses, occupational diseases, occupational accidents and increasing health expenses. Eating properly and keeping a balanced diet support personnels to be healthy and they contribute to increase work production (17). Topic-related studies show that eating properly and keeping a balanced diet in personnels increase personnels' efficiency and productivity, minimize diseases and occupational diseases, improve personnels' health, reduce absence from work, strengthen work place psychology, work peace and tranquility, increase personnels' resistance to diseases (15, 19). For these reasons, the determination of relations between working individuals' eating habits and body compositions is substantial for both protecting physical health and

making contributions to improve work peace, personnels'productivity by arranging personnels' eating habits. The purpose of the study is to analyze the effects of body structures and eating habits of personnels working in the university on work life and to enrich the literature about the significance of diet habits.

MATERIALS & METHODS

This research is a descriptive study for the determination of relations between eating habits and body compositions of working individuals.

This research was done at the university in the Central Anatolian Region of Turkey in September-November, 2014. In the relevant university, total 654 personnels including 429 academic personnels and 225 managing personnels were assigned. Sixty eight females, 124 male personnels agreed to participate in the study, the sampling group consisted of them. The participant personnels were divided into two groups: education background and work situation.

The female university members (n=18), the male university members (n=19), the female instructors (n=10), the male instructors (n=13), the female managing personnels (n=40), the male managing personnels (n=92). In this research, lecturers, research assistants, instructors and personnels included in expert staff were assessed in the group of instructors.

For carrying out this research, the institution and the participants were received approval.

In collection of data, the relevant questionnaire form consisted of 33 questions aimed at determining individuals' sociodemographical features and eating habits, and body composition measurement registration fields. The questionnaire forms were filled by the researchers with the face to face method and their body composition measurements were done by the researchers.

Body composition measurements

Height and body weight measurement

The participants' body weights were measured with the Tanita (model TBF-305; Tanita, Arlington Heights, IL) body composition analyser as kilogram, their heights were measured with a rigid measure as well. Height measurements were done without shoes, feet next to each other.

Body mass index (BMI)

BMI is the ratio of the body weight in kilograms (kg) by the square of height in meters (BMI= weight (kg) / boy^2 (m^2). Their height was entered in the Tanita body composition analyzer, determined by the analyzer.

BMI was categorized in accordance with the World Health Organization (WHO) criteria. <18.5 kg/m^2 as weak, 18.5- 24.9 kg/ m^2 as normal, 25.0-29.9 kg/m^2 as some fatter, 30.0- 39.9 kg/ m as fat, > 40.0 kg/m^2 as highly fatter were taken (22).

Estimation of body fat percentage

Body fat percentage was determined with the Tanita body composition analyser.

Waist-hip ratio (WHR)

The measurements were done with a rigid measurement. Waist circumference was measured from the thinnest part of the area between the lowest rib and crista iliac. Hip circumference was measured from the trochanter major. From both measurement results, waist-hip ratio was estimated. WHO' waist circumference, waist-hip ratio reference values; waist circumference in males ≥94 cm, in females ≥80 cm, risk of metabolic complication, in males ≥102 cm, in females ≥88 cm high risk of metabolic complication, waist - hip ratio in males ≥0.95 cm, in females ≥0.85 cm high risk of metabolic complication (22).

Waist-height ratio (WHRT)

Waist-height ratio is estimated as waist circumference (cm)/height (cm). Waist-height ratio is considered to be a better scale rather than waist circumference and BMI in scanning adult cardiometabolic risk factors. When waist circumference- height ratio is over 0.5 and below 0.4, metabolic disease risk occurs (3).

Analysis of data

Data Coding and their statistical analysis were done with the SPSS 12.0 package program on computer. In evaluation of data, chi-square test to see whether there was a relation between mean, standard deviation, percentage values, two or more variables and Pearson correlation analysis to test the relation of one variable with two or more variables were used.

RESULTS

In this research, the females had an average age of 30.85±7.07, the males had mean age of 34.85±7.40, the females had mean height of 1.63±0.06, the males had mean height of 1.75±0.09, the females had an average body weight of 60.48±10.51, and the males had mean body weight of 82.86±13.25 (Table 1).

Table 1. Personnels' descriptive characteristics.

Characteristics	Gender	n	Mean	SD
Age	Female	68	30.85	7.07
	Male	124	34.85	7.40
Height	Female	68	1.63	0.06
	Male	124	1.75	0.09
Body Weight	Female	68	60.48	10.51
	Male	124	82.86	13.25

Table 2. Distribution of personnels' descriptive characteristics in accordance with work situation.

Work Situation	Gender	Variables	n	Mean	SD
University Members	Female	Age	18	36.83	5.17
		Body Weight	18	63.37	12.46
		Height	18	162.11	6.07
	Male	Age	19	40.57	6.36
		Body Weight	19	85.32	11.40
		Height	19	175.47	6.35
Instructors*	Female	Age	10	28.50	1.65
		Body Weight	10	58.85	10.10
		Height	10	162.60	5.97
	Male	Age	13	36.00	6.92
		Body Weight	13	83.67	18.02
		Height	13	172.53	8.65
Managing Personnels	Female	Age	40	28.75	7.15
		Body Weight	40	59.59	9.65
		Height	40	162.80	6.56
	Male	Age	92	33.50	7.13
		Body Weight	92	82.23	12.92
		Height	92	174.73	9.84

* Lecturer, research assistant, instructor and personnels included in expert staff.

When the personnels' descriptive characteristics were analyzed in their distributions in accordance with work situation, among the university members, the mean age was 36.83±5.17 in the females, 40.57±6.36 in the males, the mean body weight was 63.37±12,46 in the females, 85.32±11.40 in the males, the mean height was 162.11±6.07 in the females, 175.47±6.35 in the males; among the instructors, the mean age was 28.50±1.65 in the females, 36.00±6.92 in the males, the mean body weight was 58.85±10.10 in the females, 83.67±18.02 in the males, the mean height was 162.60±5.97 in the females, 172.53±8.65 in the males; among the managing personnels, the mean age was 28.75±7.15 in the females, 33.50±7.13 in the males, the mean body weight was 59.59±9.65 in the females, 82.23±12.92 in the males, the mean height was 162.80±6.56 in the females, 174.73±9.84 in the males (Table 2).

When the personnels' body composition values were examined in gender, the averages of BMI, fat mass, fat-free mass, body water ratio, hip circumference, waist circumference, waist-hip ratio, waist-height ratio, systolic blood pressure and diastolic blood pressure values were higher in the males rather than the females, the difference between body composition values and gender except for fat mass was regarded to be statistically significant (p<0.05; Table 3).

Considering the waist-hip ratio and waist-height ratio averages in accordance with the personnels' exercise performance, these averages were higher in the managing personnels doing regular exercises

rather than other personnels, the waist-hip ratio in the managing personnels not doing exercises, the waist-height ratio in the lecturers were higher rather than the other personnels (Figure 1).

While 5.6% of the female lecturers, 20.0% of the instructors ate three meals, the female managing personnels were observed not to eat three meals. 3.3% of the male managing personnels ate three meals but the university members and the instructors were also observed not to eat three meals. The differences in the male personnels' meal numbers resulting from gender and work situation were statistically significant (p<0.05; Table 4).

Table 3. Personnels' body composition values in accordance with their gender.

| Body Composition Values	Gender	n	Mean	SD	Test
BMI	Female	68	22.86	3.58	Z= - 6.581
	Male	124	27.40	6.56	p=0.000
Fat Percentage	Female	68	27.41	8.07	Z= -5.179
	Male	124	21.05	7.19	p=0.000
Fat Mass	Female	68	17.31	7.52	Z= -0.683
	Male	124	18.00	7.81	p=0.495
Fat-Free Mass	Female	68	43.19	4.35	Z= -10.800
	Male	124	64.92	8.46	p=0.000
Body Water Ratio	Female	68	31.62	3.18	Z= -10.985
	Male	124	48.33	11.06	p=0.000
Hip Circumference	Female	68	96.46	9.28	Z= -6.021
	Male	124	104.13	7.69	p=0.000
Waist Circumference	Female	68	78.99	11.21	Z= -8.218
	Male	124	96.01	10.53	p=0.000
Waist-Hip Ratio	Female	68	0.82	0.12	Z= -8.946
	Male	124	0.92	0.06	p=0.000
Waist-Height Ratio	Female	68	0.49	0.07	Z= -2.686
	Male	124	0.55	0.07	p=0.007
Systolic Blood Pressure	Female	68	115.18	12.31	Z= -4.773
	Male	124	124.67	14.68	p=0.000
Diastolic Blood Pressure	Female	68	73.87	9.65	Z= -3.236
	Male	124	78.81	11.46	p=0.001
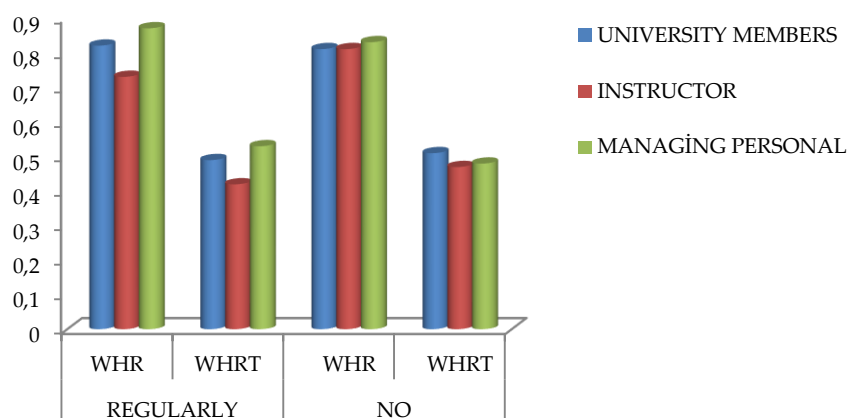
Figure 1. Waist-hip ratio and waist-height ratio averages in accordance with personnels' exercise performance.

Table 4. Chi-Square test results of personnels' meal numbers in accordance with gender and work situation.

Daily meal numbers			University Members		Instructors		Managing Personnels	
Female	One Meal	n	5		2		9	
		%	27.8		20		22.5	
	Two Meals	n	7		3		13	
		%	38.9		30		32.5	
	Three Meals	n	1	X²=4.308	2	X²=0.286	-	X²=0.727
		%	5.6	p=0.116	20	p=0.867	-	p=0.394
	Four Meals	n	-		-		-	
		%	-		-		-	
	Total	n	n		7		22	
		%	%		70		55	
Male	One Meal	n	6		5		25	
		%	31.6		38.5		27.2	
	Two Meals	n	4		2		11	
		%	21.1		15.4		12	
	Three Meals	n	-	X²=0.400	-	X²=1.286	3	X²=37.732
		%	-	p=0.527	-	p=0.867	3.3	p=0.000
	Four Meals	n	-		-		1	
		%	-		-		1.1	
	Total	n	n		7		10	
		%	%		53.8		43.5	

Table 5. Chi-Square test results of personnels' fast food consumption in accordance with gender and work situation.

Fast food consumption		n %	University Members		Instructors	p	Managing Personnel	p
Female	3-5 times in a week	n	-		2		1	
		%	-		20		2.5	
	Once in a week	n	7		1		8	
		%	38.9		10		20	
	Once in 15 days	n	3		3		9	
		%	16.7	X²=2.444	30	X²=2.000	22.5	X²=20.750
	Once a month	n	5	p=0.485	4	p=0.572	18	p=0.000
		%	27.8		40		45	
	Non-Consuming	n	3		-		4	
		%	16.7		-		10	
	Total	n	n		10		40	
		%	%		100		100	
Male	3-5 times in a week	n	2		-		7	
		%	10.5		-		7.6	
	Once in a week	n	3		3		14	
		%	15.8		23.1		15.2	
	Once in 15 days	n	3		4		12	
		%	15.8	X²=2.842	30.8	X²=2.692	13	X²=39.849
	Once a month	n	6	p=0.585	5	p=0.442	42	p=0.000
		%	31.6		38.5		45.7	
	Non-consuming	n	5		1		17	
		%	26.3		7.7		18.5	
	Total	n	19		13		92	
		%	100		100		100	

Among the female university members, fast food consumption was in 38.9% of the university members once in a week, in 40.0% of the university members and 45.0% of the managing personnels once in a month, fast food consumption was also once in a month by 31.6% of the male university members, by 38.5% of the instructors and by 45.7% of the managing personnels. Our research indicated that the relation between personnels' fast food consumption, gender and work situation was statistically significant (p<0.05; Table 5).

Table 6. Correlation analysis in personnels' full fat milk and yogurt consumption and body compositions.

Full fat milk/yogurt consumption	n	r	P
Body Weight	18	0.61	0.008*
BMI	18	0.62	0.006*
Fat Percentage	18	0.54	0.022*
Fat Mass	18	0.58	0.012*
Fat-Free Mass	18	0.59	0.010*
Waist Circumference	18	0.55	0.018*
Waist-Hip Ratio	18	0.50	0.034*
Waist-Weight Ratio	18	0.50	0.033*

* $p < 0.05$

A positively significant relation was found between full fat milk and yogurt consumption and body compositions ($p < 0.05$; Tablo 6).

DISCUSSION

The prevalance of obesity has been increasing all over the world day by day (1). When BMI reaches 25 and over it, the risks of hypertension, type 2 Diabetes Mellitus and cardiovascular diseases concerning the obesity degree show increases (8). According to the Turkey Nutrition and Health Research 2010 (4) results, BMI average was found to be 26.4±4.5 in males aged 19 and over, 28.9±6.4 in females. Ulaş & Genç (20) compared the BMI values in gender within their study, the males' BMI values were considered to be significantly higher than the females' ones. Berkel's research (6) showed that the participant female academic staff's BMI average was 22.89, the males' one was 26.15. This research found that the male personnels' BMI average was 27.40±6.56 (Table 3). Hereby, we can say that the adult males are fatter/more weighted, so they have risks of hypertension, type 2 Diabetes Mellitus and cardiovascular diseases.

The waist circumference and waist/hip ratio are used for the risk evaluation in chronical diseases among the adults (13). The waist/hip ratio assses abdominal obesity (11). Abdominal obesity is more closely related with metabolic complications rather than BMI. According to the Turkey Nutrition and Health Research 2010 (4) results, the waist circumference was >102 cm in 24.8% of males aged 19 and over, >88 cm in 53.9% of females. This research determined that the females' waist circumference was 78.99±11.21, the males' ones 96.01±10.53 (Table 3). Hereby, we can say that males have risks of metabolic complication. Also, the females' waist/hip ratio was 0.82±0.12, the males' one was 0.92±0.06 in our study. The result of the study shows the participant individuals were below the risk values of metabolic complication.

The waist/height ratio is seemed to be a better scale rather than the waist circumference and BMI in scanning cardiometabolic risk factors in adults. When the waist circumference / height ratio is over 0.5 and below 0.4, the metabolic disease risk occurs (3). According to the Turkey Nutrition and Health Research 2010 (4) results, the waist/height ratio was 0.59 in females aged 19 and over, 0.55 in males. From this research, it was seen that waist/height ratios of all workers were over 0.50. So it can be said that all personnels under the risk of metabolic disease.

Regular activities have positive effects on body composition as well as health (10). Energy expenditures develop due to activities, so decreases are seen in body weight and other measurements (18). Özenoğlu et al. (12) suggested that the females' waist-height ratio was 0.52±0.7 before exercises, it was 0.51±0.6 after exercises in their research about females. Concerning the personnels' exercise performance herein, waist-hip ratio and waist-height ratio averages were higher in the managing personnels doing regular exercises rather than the other personnels, waist-hip ratio in the managing personnels not doing exercises and waist-height ratio in the university members were regarded to be higher than the other personnels (Figure 1).

Eating habits such as meal skip, short or long periods between meals influence metabolism, thus human health. When daily meal number is below three, it causes undesirable metabolic changes in any organism (2). Berkel's research (6) indicated that 69.4% of the university members working in the university consumed three main meals in a day, 70.9% of them skipped a meal. Ulaş & Genç (20) presented that 57.4% of the personnels assigned in the military hospital skipped a meal. While 5.6% of the female university members and 20.0% of the instructors ate three meals, the female managing personnels did not eat three meals. 3.3% of the male managing personnels ate three meals, however, the university members and the instructors were determined not to eat three meals. The differences in the male personnels' meal numbers from gender and work situation were regarded to be statistically significant ($p < 0.05$; Table 4). In this regard, the female managing personnels, the male university members and the instructors' daily meal numbers were below three, that's why, undesirable metabolic changes are likely to ocur in their organisms.

When consuming fast food products, insufficient nutrients or excessive nutrients are available in menus. This situation triggers chronic diseases such as obesity, diabetes, cardiovascular diseases and cancer (7). Berkel's paper (6) showed that 37.7% of university members working in the university consumed fast food products once in a month and more scarcely. From this research, it was clear that fast food consumption was once in a week by 38.9% of the female university members, once in a month by 40.0% of the instructors and 45.0% of the managing personnels, once in a month by 31.6% of the male university members, 38.5% of the instructors and 45.7% of the managing personnels. This research indicated that there was a statistically significant difference between the personnels' fast food consumption, gender and work situation (p<0.05) (Table 5). Since increasing fast food consumption becomes a part of modern life, personnels are considered to eat fast food products, and for this reason, risks of metabolic diseases are regarded to increase as well.

An adult who consumes two glasses of milk-yogurt in a day, meets the half of daily calcium need. Milk products are rich in saturatiod fat and cholesterol. Adult individuals who are required to limit fat and cholesterol intake, must prefer fat-free and fat-reduced milk, yogurt and cheese varieties (25). Uzunöz & Gülşen's research (21) determined that from the university students, 13.33% consumed fat-free yogurt, 43.67% consumed low-fat yogurt, 25.0% consumed fat yogurt and 18.0% also consumed full-fat yogurt. Zemel's research (26) represented that there was 22% more weight loss and 61% more body fat loss in the group eating 170 g portion of fat-free yogurt in a day during 12 weeks rather tha in the control group. In this research, a positively significant relation was found between full-fat milk and yogurt consumption and body composition (p<0.05; Table 6). This result indicates that body composition values increase when full-fat milk and yogurt consumption increase.

According to the results of this research, it can be said that the staff working in university keep an unhealthy diet. Eating properly and keeping a balanced diet are effective for protecting body composition. That's why, university personnels are required to join in necessary activities in order to have healthy lifestyles (exercises, physical activities, diet habits and health responsibilities).

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