Original Article

Obesity among University Students and their Awareness of it with Regards to Some Aspects and the Education they Receive

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Abstract

Background: Obesity is a current health problem which basically can be prevented, corrected and improved, and the global prevalence of obesity is 11%, while around 30% in Turkey. In studies, it is reported that a high rate of obesity develops in the transition from adolescent to youth and continues in later years.

Objectives: This study aims to investigate the obesity status and the awareness of the students who have normal education at the undergraduate level in terms of some socio-demographic characteristics and the effects of education.

Methods: The population of the study, which is in the descriptive and relational survey model, was composed of the daytime university students in the academic year 2017-2018. In the sampling surveys 10% of the participants were included in the sampling rate, and the research was carried out with 1441 people due to possible losses. The data were collected with "Questionnaire" prepared by the researchers based on the literatüre. The data were evaluated with statistical package program SPSS 22.0. Percentage, mean, chi-square, Mann-Whitney-U, Kruskal Wallis tests and correlation analyses were performed.

Results: The mean age was 21.07 ± 2.03 (17-40) years. 15.7% of the participants were pre-obese, and 0.3% were obese. Body mass index was higher in males, in those who received education outside the health field, in those with a nuclear family, in those with a smoking habit and the family with obese individuals ($p < 0.001$). Women's perception of obesity as a disease, obesity detection according to body mass index and knowledge of both types of obesity (men and women) were perceived to be equally harmful ($p < 0.001$). The participants interpreted obesity as increasing the relationship between hypertension, heart disease, stroke, diabetes, breast-prostate and colon cancers, menstruation disorder, infertility, osteoarthritis, snoring and sleep apnea.

Conclusion: Efforts should be made to increase the awareness of obesity among university students.

Keywords: Undergraduate education, obesity, awareness

Introduction

Obesity is one of the most important health issues of today it constitutes a priority field of study of the health policies of Turkey and various countries of the world with its constantly increasing incidence (Yilmaz, 2017).

The primary cause of the disease is the disorder of the carbohydrate metabolism, and it is reported to be fully preventable, correctable and curable (Kahraman, et al. 2015). The word has a Latin origin and consists of the combination of the words “ob” (because of) and “edere” (meal).

Obesity is defined by the World Health Organization to be “abnormal or excessive fat accumulation in the body deranging its health (WHO). These chronic diseases are known to be caused by genetic predisposition, lifestyle or

environmental factors and causing the death of 35 million people every year with 80% of the casualties taking place in countries with low and medium income (Yilmaz,2017). According to the 2008 data of WHO, the obesity prevalence in the world is around 11% (Obesity Diagnosis and Treatment Guide,2017) Studies in Turkey report that 30% of the people are obese[3] and the obesity prevalence increased by 44% in the last 12 years (Yilmaz, 2017; Turkey Obesity Program to Combat and Control, 2010).

Obesity-induced health problems / risk factors: insulin resistance-hyperinsulinemia, type 2 diabetes, hypertension, coronary artery disease, hyperlipidemia-hypertriglyceridemia, metabolic syndrome, gallbladder diseases, some types of cancer (gallbladder, endometrium, ovarian and breast cancers in women; colon and prostate cancers in men), osteoarthritis, stroke, sleep apnea, fatty liver, asthma, breathing difficulty, pregnancy complications, menstrual irregularities, excessive hair development, increased risk of pre- and post-operative complications, mental problems [anorexia nervosa (not eating), bulimia nevroza (no benefit of food by vomiting), binge eating, night-eating syndrome, or trying to provide psychological satisfaction by eating anything excessively, social incompatibilities], skin infections, fungal infections in the groin and feet due to excessive subcutaneous adipose tissue as a result of frequent weight loss and weight gain in particular, and musculoskeletal problems(Obesity Diagnosis and Treatment Guide, 2010; Branca, et al. 2007; Tam & Cakir, 2012;Ata, et al. 2014).

There are two different measurement methods used in evaluating obesity: central and abdominal measurements: In central evaluation, Body Mass Index (BMI) is taken into consideration, while abdominal evaluation focuses on waist/hip circumference ratio (WHR). According to the WHO criteria, a WHR of 0.85 and above in women and a WHR of 1.00 and above are accepted to be abdominal obesity (=android type=male type obesity). Studies support the argument that WHR type obesity causes complications (Tanyolac, 2004).

Several cross-sectional studies determined obesity by BMI. BMI is grouped by WHO as follows (Figure 1) (Ozbahar Acar, 2015).

Studies reveal that 50% of the people who are obese in the adolescence period are also obese in their adult ages(Yilmaz, 2017).

In developed countries, obesity ratio was determined to be 31% in adults, 15.3% in children and 15.5% in adolescents. This increasing ratio of obesity causes an alarm due to emerging health problems. As mentioned above, evidence suggests that obesity is a result of a number of complex factors, including genetics, environment, socioeconomic status, and behaviors (National Institutes of Health, 2017). One important cause of the increase in obesity in the last 10 to 20 years is the transition of lifestyle due to industrial developments from the one that is based on power to the one that is based on inactivity and to the unhealthy fast-food based eating style. These factors are observed among university students when they start their university education (Ozbahar Acar, 2015).

Adult obesity rates are highest in the United States, Mexico, New Zealand, and Hungry and lowest in Japan and Korea (OECD, 2017). In the United States, 36% of adults and 17% of youth meet the criteria for obesity (Ogden, et al. 2017). In Europe as a whole, estimates for 2008 indicated that 50% of both men and women in the WHO European Region were overweight, and roughly 23% of women and 20% of men were obese (WHO, 2014).

The years at a university is a period that shapes life habits particularly including nutrition, physical activity and stress. Studies show that a high ratio of obesity develops among late adolescents and that their obesity is permanent which is an important risk (Racette, et al. 2005; Sert, et al. 2016).

Obese individuals are usually stigmatised to be unattractive, weak-willed, lazy, inert, slow, selfish, loving eating, frail, lacking motivation, worthless, worried, shapeless, lacking self-confidence and having negative body perception. They are blamed for their weights and subjected to extreme behaviours. In such situations are experienced in every part of life including family, life, education and health and the obese people encounter problems including stigmatisation, social exclusion and discrimination by society in addition to psychological problems including anxiety and depression due to these behaviours they are subject to (Sert, et al. 2016).

Public organisations and agencies are not sufficient in fighting against/protection from obesity. The persons themselves need to be willing to preventing obesity and tending towards preventing health behaviour. In other word, doctors are decisive in obesity treatments while the active participation of individuals in health-related recommendations and arrangements (Racette, et al. 2005; Gordon-Larsen, et al.2004)

The study aims to examine the obesity and awareness among university students who have undergraduate education during daytime hours with regards to some qualities and the effect of the education that is received.

Material and methods

Study design and setting: The study is planned in a descriptive cross-sectional type. The population of the study consists of the university students in a city centre in the academic year of 2017 to 2018 having daytime education (total 10.523 people). The students who attend the school between 17:00 and 23:00 hours within the scope of evening education were excluded from the study as they are more exposed to the risk of obesity. The sample included the group of 10% with an ideal sampling ratio in the survey (1052 people), and the study was conducted with 1441 people to increase the representative power of the sample for the population. Since the study intends to compare the students who do and don't take health education, it was planned to have the participants consisting of the students who do and don't take undergraduate education. In this context, the students who take undergraduate health education consisted of the students in the fields of nursing and midwifery and voluntary participation were used among the students of different faculties other than health education.

Data collection: In this study, survey form that was developed by the literature knowledge (1-12) was used as the data collection instruments and the data was collected by the face-to-face interview method by the researchers. The survey form covers the questions to measure some socio-demographic qualities, health history and health behaviours of the university students. With regards the obesity, central method technique was used in screening, WHR measurement was not conducted, and the WHR awareness of the university students was recorded according to their statements. In measurements, inflexible tape measure with a standard length was used to determine the height while a digital scale did the weight monitoring at the same time of the day.

Statistical analyses: Both BMI and WHR were analysed both quantitative and categorical ways in this study. WHO's classification method was used for the classifying BMI. On the other hand, all of the three obese groups (class I, Class II, Class II) defined by WHO (see figure 1) was transformed as a single group for statistical analyses. All findings were summarised by statistical methods such as mean, standard deviation, frequency, percentage, etc. The independent sample Mann Whitney U test, one of the parametric hypothesis tests, was used to test the significance of the mean differences of the two group independent variables in the study. The Kruskal Wallis test was used to test the significance of the mean differences between groups when the number of groups was higher than double. Spearman correlation test was used to determine the relationship between continuous numerical variables. In all analyses, statically significance level was accepted as $p < 0.05$.

Ethical Issues: Ethics committee and authority permissions were obtained before the study, participants were informed within the scope of the Helsinki Declaration Criteria, and voluntary participation principle was used.

Results

The average age in this study is 21.07±2.03 (17-40). 34.4% of the participants in the study are students in the field of health. 74.3% of the university students have a nuclear family, 23.5% of them have an extended family, and the remaining has a fragmented family. The ratio of smokers is 23.6% while 70.1% stated that they never smoked before and 6.3% stated that they smoked before but quitted. The ratio of those consuming alcohol is 7.1% while 88.5% stated that they never drank alcohol before and 4.3% stated they drank alcohol before but quitted now. 89.5% of the university students stated that they don't have the habit of using any pleasure-inducing substance and 10.5% (151 people) stated that they use. With regards to using a pleasure-inducing substance, almost all of the university students (140 people) stated they smoked water pipe and one person mentioned about the use of marijuana. The ratio of those with the habit of using the non-prescription drug is 11.7%, and painkiller is the most frequently

used medicine. 21.5% of the university students in this study stated that they had professional assistance for losing weight and 87.8% stated they managed to lose weight through this assistance.

61.6% of the university students in this study are women, 79.5% of them have a perception of low income and 63,1% find themselves to be in normal weight (Table 1).

As shown in Table 2, 82.5% of university students consider obesity to be a disease. 74.7% of them believe that BMI determines obesity. 11% replied with "I don't know" to the question about the type of fat to be preferred in food preparation. The ratio of those who don't want to receive any information about obesity is 46.8%.The participants in the study were asked whether they know the connection between obesity and the other health conditions it may cause and they replied that they didn't know whether obesity causes hypertension (15.1%), stroke (30.1%), breast cancer (49.8%), prostate cancer (51.6%), intestinal cancer (51.6%), menstrual irregularity (37.6%), infertility/impaired fertility (36.2%), arthrolith (25.5%), snoring (20.5%) and sleep apnea (18.5%).

As shown in Table 4, 73.3% of university students have normal BMI ratios. However, 2.4% of them was found to be 1st grade obese. This study compares some features on whether obesity is perceived to be a disease or not. It was determined that no difference was created by the variants including age range, civil status, type of the parent family, place where majority of life is spent, current employment in a job with income, income level perception, smoking habit, alcohol habit, habit of using pleasure inducing substance, having any chronic disease and presence of obese individuals in the family ($p>0.05$). However, as shown in Table 5, those who received health education, who have both parents to be primary school graduates and who don't try to lose weight have a higher ratio of considering obesity to be disease ($p<0.05$). This study examined some aspects of the university students with regards to BMI scores and determined that there was no statistical difference caused by the variants including employment, having a chronic disease, civil status, place where majority of life is spent, income level perception, mother's education level, father's education level, current way of accommodation, perception on whether obesity is a disease and feeling oneself knowledgeable about obesity ($p>0.05$). However, as shown in Table 6, average BMI ranks are higher with a statistical difference in those who have education in a field other than health, in men, in those who are 26 years and older, who smoke, who use pleasure inducing substance (marijuana, cocaine etc.), who don't make any effort to lose weight, who want to be informed about obesity and who have obese individuals in the family ($p<0.05$).

Figure 1. BMI Classification by WHO

Classification	**BMI**
Thin (underweight)	<18.50
• severe thinness	<16.00
• moderate thinness	16.00-16.99
• mild thinness	17.00-18.49
Normal	**18.50-24.99**
Pre-obese	**25.00-29.99**
Obese	**≥ 30.00**
Class I	30.00-34.99
Class II	35.00-39.99
Class III	≥ 40.00

Table 1. Some Defining Features and Health Features of the University Students (N=1441)

Features		Number	%
Age Groups	Under 25	1409	97.8
	26 and above	32	2.2
Sex	Female	887	61.6
	Male	554	38.4
Civil Status	Married	18	1.2
	Single	1408	97.7
	Informal marriage	7	0.5
	Unwilling to reply	8	0.6
Place where they lived for a long time	Village	247	17.2
	District-Town	486	33.8
	City centre	708	49.0
The current type of residence	With family	143	9.9
	Rented flat with friends	264	18.3
	Public dormitory	527	36.6
	Private dormitory	453	31.4
	Alone in a rented flat	34	2.4
	With relatives	10	0.7
	Unwilling to reply	10	0.7
Employment status	No	1393	96.7
	Yes	48	3.3
Mother's education level (n=1383)	Illiterate	87	6.3
	Literate (no graduation)	23	1.7
	Primary school	730	52.8
	Secondary school	231	16.7
	High school	236	17.0
	University	76	5.5
Father's education level (n=1380)	Illiterate	18	1.3
	Literate (no graduation)	11	0.8
	Primary school	479	34.7
	Secondary school	277	20.1
	High school	387	28.0
	University	208	15.1
Perception of income level	Low income	251	17.4
	Moderate income	1145	79.5

	High income	45	3.1
Perception of weight	Thin	218	15.1
	Normal	909	63.1
	Overweight	276	19.2
	Obese	38	2.6
Use of alcohol	Yes	103	7.1
	Never used	1276	88.5
	Used but quitted	62	4.3
The habit of using the non-prescription drug	No	1273	88.3
	Yes	168	11.7

Table 2. Some Aspects of the University Students Regarding their Awareness of Obesity (N=1441)

Some Aspects of Obesity Awareness		**Number**	**%**
Is obesity a disease?	Yes	1189	82.5
	No	149	10.3
	I don’t know	103	7.1
How is obesity determined?	Per weight	294	20.4
	Per dimension	8	0.6
	Per BMI score	933	64.7
	Per WHR score	83	5.8
	I don’t know	123	8.5
Which fat is preferable in food preparation?	Margarine	14	1.0
	Butter	564	39.2
	Vegetable oil	692	48.0
	I don’t know	159	11.0
	I don't matter	12	0.8
Which food preparation method is healthier?	Frying	52	3.6
	Boiling	1052	73.0
	Grilling	200	13.9
	I don’t know	137	9.5
Which food group has a lower calorie content?	Meat, milk, egg	193	13.4
	Vegetable, fruit	1113	77.2
	Bread, pasta, biscuits	60	4.2
	I don’t know	75	5.2
Does exercise have any benefit	Yes	1320	91.6

other than weight control?	No	41	2.8
	I don't know	80	5.6
Which type of obesity is more harmful?	Female type	245	17.0
	Male type	224	15.5
	Both	786	54.5
	I don't know	186	12.9
Do you want to be informed about obesity? (n=684)	Yes	556	38.6
	No	674	46.8
	I don't know	211	14.6
Do you feel knowing obesity?	Yes	414	28.7
	No	343	23.8
	Partly	684	47.5
Source of information about obesity*	Family	268	18.6
	Friend	351	24.4
	Printed media	451	31.3
	Visual media	504	35.0
	Internet	936	65.0
	Health personnel	515	35.7
	Other	73	5.1
Do you have any obese person in the family?	Yes	128	9.2
	No	1180	85.1
	I don't want a reply	78	5.7

*Multiple responses

Table 3. Knowledge of University Students on the Relation between Obesity and Various Health Conditions (N=1441)

	In obesity							
	Increase		**Decrease**		**No change**		**I don't know**	
	S	**%**	**S**	**%**	**S**	**%**	**S**	**%**
Frequency of hypertension	1180	81.9	15	1.0	28	1.9	218	15.1
Frequency of cardiac diseases	1247	86.5	18	1.2	29	2.0	147	10.2
Frequency of stroke	861	59.8	20	1.4	126	8.7	434	30.1
Frequency of diabetes	1200	83.3	20	1.4	47	3.3	174	12.1
Frequency of breast cancer	427	29.6	22	1.5	275	19.1	717	49.8

Frequency of prostate cancer	435	30.2	24	1.7	238	16.5	744	51.6
Frequency of intestinal cancer	435	30.2	24	1.7	238	16.5	744	51.6
Frequency of menstruation irregularity	696	48.3	63	4.4	140	9.7	542	37.6
Frequency of infertility	721	50.0	64	4.4	135	9.4	521	36.2
Frequency of arthropathy	979	67.9	23	1.6	71	4.9	368	25.5
Frequency of snoring	1040	72.2	27	1.9	79	5.5	295	20.5
Frequency of sleep apnea	1102	76.5	22	1.5	50	3.5	267	18.5

Table 4. Conditions of University Students according to BMI and WHR Classifications (N=1441)

Some Descriptive and Health Features			**Number**	**%**
BMI	Thin <18.50		111	7.7
	Normal 18.50-24.99		1056	73.3
	Pre-obese 25.00-29.99		226	15.7
	Obese ≥30		5	0.3
	1st grade obese 30.00-34.99		34	2.4
	2nd grade obese 35.00-39.99		7	0.5
	3rd grade obese ≥ 40.00		2	0.1
WHR*	Women (n=187)	Low	89	47.6
		High	98	52.4
	Men (n=110)	Low	72	65.5
		High	38	34.5

This calculation includes only those who provide their WHR ratios.

Table 5. Distribution of University Students According to Some Aspects with regards to Obesity Awareness (N=1441)

Some Aspects		n	Is Obesity a disease?*			Test value
			Yes n (%)	**No n (%)**	**Don't know n (%)**	
Group	Health	496	429 (86.5)	44 (8.9)	23 (4.6)	χ^2=9.70
	Non-health	945	760 (80.4)	105 (11.1)	80 (8.5)	**p=0.008**
Sex	Female	887	757 (85.3)	76 (8.6)	54 (6.1)	χ^2=12.87
	Male	554	432 (78.0)	73 (13.2)	49 (8.8)	**p=0.002**
Mother's education level (n=1383)	Illiterate	87	74 (85.1)	8 (9.2)	5 (5.7)	
	Literate	23	19 (82.6)	1 (4.3)	3 (13.0)	
	Primary school	730	620 (84.9)	64 (8.8)	64 (8.8)	χ^2=19.90
	Secondary school	231	190 (82.3)	29 (12.6)	29 (12.6)	**p=0.03**
	High school	236	186 (78.8)	35 (14.8)	35 (14.8)	
	University	76	60 (78.9)	5 (6.6)	5 (6.6)	
Father's education level (n=1380)	Illiterate	18	10 (55.6)	6 (33.3)	2 (11.1)	
	Literate	11	8 (72.7)	3 (27.3)	0 (0.0)	
	Primary school	479	408 (85.2)	44 (9.2)	27 (5.6)	χ^2=24.58
	Secondary school	277	232 (83.8)	30 (10.8)	15 (5.4)	**p=0.006**
	High school	387	319 (82.4)	43 (11.1)	25 (6.5)	
	University	208	167 (80.3)	18 (8.7)	23 (11.1)	
Trying to lose weight	No	924	743 (80.4)	104 (11.3)	77 (8.3)	χ^2=8.52
	Yes	517	446 (6.3)	45 (8.7)	26 (5.0)	**p=0.014**

** Row percentage is taken.*

Table 6. Distribution of the BMI Scores of the University Students with regards to Some of Their Aspects (N=1441)

Some Aspects		n	BMI Mean Rank	MW U/KW Test value
Group	Health	496	672.76	MW U= 210434.0
	Non-health	945	746.32	**p=0.001**
Sex	Female	887	631.79	MW U= 166566.5
	Male	554	863.84	**p=0.001**
Age range	Under 25 years	1409	716.09	MW U=15620.5
	26 years and above	32	937.36	**p=0.003**
Smoking (n=1350)	Yes	340	742.13	MW U=149045.5
	No	1010	653.07	**p=0.001**
Alcohol habit (n=1379)	Yes	103	762.27	MW U=58270.0
	No	1276	684.17	p=0.056
Using pleasure inducing substance	Yes	151	851.71	MW U=77676.0
	No	1290	705.71	**p=0.001**
Trying to lose weight	Yes	924	612.77	KW=138852.5
	No	517	914.43	**p=0.001**
Presence of obese individuals in the family?	Yes	128	820.18	MW U=54312.5
	No	1180	636.53	**p=0.001**
Weight perception	Thin	218	302.52[a,b,c]	
	Normal	909	680.63[a,d,e]	KW=533.8
	Weight	276	1111.25[b,d,f]	**p=0.001**
	Obese	38	1252.96[c,e,f]	
Family type	Nuclear	1071	709.00[a,b]	KW=12.3
	Extended	338	775.54[a,c]	**p=0.002**
	Fragmented	32	546.69[b,c]	
Willing to be informed about obesity?	Yes	556	754.88[a]	KW=9.323
	No	674	685.45[a]	**p=0.009**
	I don't know	211	745.28	

[a,b,c,d,e,f] Indicates the groups causing difference.

Discussion

Looking at the studies conducted in the world and Turkey, obesity continues to be increasingly present in all age groups. Every person is considered to be a candidate for obesity. When looking into the aetiology of obesity, studying specific groups will be a better approach. Life conditions and styles of people with common features are similar. University students who usually live on their resources and away from their families are an ideal group to study to determine the eating habits and obesity prevalence of young people. The purpose of the

study is to examine the obesity level and awareness of undergraduate university students with daytime education with regards to some aspects, and to the education they receive.

Only 73.3% of university students in the study were found to have normal BMI values. The remaining students were found to be thin (7.7%), pre-obese (15.7%) and obese (50.3%). Studies on the obesity levels of university students in Turkey have different prevalence with remarkable increases in the ratios of pre-obese or obese. The ratio of those who are pre-obese was found to be 21.7% in men and 16.8% in women in the study of Dulger and Mayda (2016), 12.7% in the study by Sert et al. (2016), 7.9% in women and 26.5% in men in the study by Aydogan Arslan et al. (2016) and 15.1% in the study by Uluoz (2016). The world data indicates that the ratio of overweight men is higher. For example, in a study in Bahrain by Nizer Jaouna et al. (2018), the proportion of overweight people was 21.9% in women and 29.4% in men. Karabulut et al. (2018) found higher BMI values in men than women in their study conducted in the USA. The cause of the differences is attributed to the differences in sample groups. A21.5% of the university students in this study stated that they received professional support for losing weight and 87.8% of them stated that managed to lose weight after assistance. A 82.5% of university students consider obesity to be a disease. 74.7% of them believe that BMI determines obesity. 11% replied with "I don't know" to the question about the type of fat to be preferred in food preparation. The ratio of those who don't want to receive any information about obesity is 46.8%.

The participants in the study were also asked whether they know the connection between obesity and the other health conditions it may cause and they replied that they didn't know whether obesity causes hypertension (15.1%), stroke (30.1%), breast cancer (49.8%), prostate cancer (51.6%), intestinal cancer (51.6%), menstrual irregularity (37.6%), infertility/impaired fertility (36.2%), arthrolith (25.5%), snoring (20.5%) and sleep apnea (18.5%). The fat tissue caused by obesity affects the production of various adipokinines and plays an important role in carcinogenesis. Some substances that are produced are essential in the progress and reoccurrence of cancer. Therefore, it is necessary to ensure that individuals have healthy eating and physical activity habits to prevent obesity-related cancers (Urhan&Akbulut, 2017).

Those who received health education, who have both parents to be primary school graduates and who don't try to lose weight have a higher ratio of considering obesity to be disease ($p<0.05$).

Average BMI ranks are higher with a statistical difference in those who have education in a field other than health, in men, in those who are 26 years and older, who smoke, who use pleasure inducing substance (marijuana, cocaine etc.), who don't make any effort to lose weight, who want to be informed about obesity and who have obese individuals in the family ($p<0.05$). Similar to the present study, the study by Uluoz (2016) has higher BMI scores in men and in those who have obese individuals in the family. Another study conducted in Turkey found that female university students have a more negative attitude towards obesity which supports these findings (Usta, et al. 2015). In a study by Jiang et al. (2018) including the students in 50 universities in China, men have a higher ratio of being pre-obese and obese than women. Similarly, the study by Chengi et al. (2018) found higher ratios of pre-obesity and obesity in men.

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