

Investigation of the relationships between eating attitudes, body image and depression among Turkish university students

Studio delle relazioni tra comportamenti alimentari, immagine corporea e depressione tra gli studenti universitari turchi

SÜMEYRA N. TAYFUR¹, ALPER EVRENSEL^{1*}

E-mail: alperevrensel@gmail.com

¹Department of Psychiatry, Uskudar University, Istanbul, Turkey

SUMMARY. Introduction. Eating disorders are one of the most prevalent psychiatric disorders and have become a growing problem nowadays. Research shows that eating disorders are mostly widespread in industrialized societies where beauty is associated with thinness. This study investigates the relationships between eating attitudes, body image and depression among Turkish university students aged 18 to 25. **Materials and methods.** The sample comprised of 221 female and 80 male university students from four different universities located in Istanbul and Ankara. Demographic Information Form, Body Image Scale, Eating Attitude Test (EAT-40) and Beck Depression Inventory were used to collect data. Height and weight of the participants were also collected to measure Body Mass Index (BMI) of the individuals. **Results.** This study found that 55 (18.3%) students had abnormal eating attitudes, 115 (38.2%) students had negative body image and 102 (33.9%) students showed moderate and severe levels of depression. Body image was negatively correlated with eating attitude and depression in underweight individuals when grouped according to their BMI. Being underweight was significantly higher in females. Females also had more negative body image and higher depression levels. Individuals with abnormal eating attitudes had higher depression levels. BMI and gender did not lead to any significant difference in the eating attitudes of the students. **Conclusion.** This study has contributed to the literature on the relationships between eating attitudes, body image and depression among Turkish university students between the ages of 18 and 25. It has further drawn attention to the importance of eating disorders in Turkey and being aware of the relationships among eating attitudes, body image, depression, and BMI. Results of the study are discussed in detail and in consideration of cultural context.

KEY WORDS: eating attitude, body image, depression, body-mass index, university, student.

RIASSUNTO. Introduzione. I disturbi alimentari sono tra i disturbi psichiatrici più diffusi e sono oggi diventati un problema in crescita. La ricerca dimostra che i disturbi alimentari sono diffusi prevalentemente nelle società industrializzate dove la bellezza è associata all'essere magri. Questo studio esamina le relazioni tra comportamenti alimentari, immagine del corpo e depressione tra gli studenti universitari turchi di età compresa tra i 18 e i 25 anni. **Materiali e metodi.** Il campione comprendeva 221 studenti universitari di sesso femminile e 80 di sesso maschile provenienti da quattro diverse università situate a Istanbul e Ankara. Per raccogliere i dati sono stati utilizzati il modulo informativo demografico, la scala delle immagini corporee, il test sul comportamento alimentare (EAT-40) e il questionario di Beck sulla depressione. Per misurare l'indice di massa corporea (BMI) dei soggetti sono stati registrati anche l'altezza e il peso dei partecipanti. **Risultati.** Questo studio ha rilevato che 55 (18,3%) studenti avevano comportamenti alimentari anormali, 115 (38,2%) studenti avevano un'immagine corporea negativa e 102 (33,9%) studenti mostravano livelli di depressione moderati e gravi. L'immagine corporea era negativamente correlata con il comportamento alimentare e la depressione nei soggetti sottopeso quando venivano raggruppati in base al loro BMI. Nelle donne era stata riscontrata un'incidenza di soggetti sottopeso notevolmente più alta. Le donne risultavano avere anche un'immagine corporea più negativa e livelli di depressione più elevati. Gli individui con atteggiamenti alimentari anormali avevano livelli di depressione più elevati. Relativamente a BMI e genere non si sono riscontrate differenze significative riguardo a comportamenti alimentari degli studenti. **Conclusione.** Questo studio ha contribuito alla letteratura sulle relazioni tra atteggiamenti alimentari, immagine corporea e depressione tra gli studenti universitari turchi di età compresa tra i 18 e i 25 anni. Ha inoltre attirato l'attenzione sull'importanza dei disturbi alimentari in Turchia e sulla consapevolezza delle relazioni tra atteggiamenti alimentari, immagine del corpo, depressione e BMI. I risultati dello studio sono stati discussi in dettaglio e in considerazione del contesto culturale.

PAROLE CHIAVE: comportamento alimentare, immagine corporea, depressione, indice di massa corporea, università, studente.

INTRODUCTION

Eating disorders are one of the most prevalent psychiatric disorders and have become a growing problem nowadays.

Research shows that eating disorders are mostly widespread in industrialized societies where beauty is associated with thinness. The 'thin ideal' of the industrialized West seems to be creating a pressure to be thin, especially in women¹. Im-

Investigation of the relationships between eating attitudes, body image and depression among Turkish university students

portance given to thinness in the society and social pressure from friends, family and social media about physical appearance pave the way for eating disorders and related consequences. Weight and body shape concerns, discrepancy between self and ideal, and perfectionism are also considered as major risk factors². Psychopathological components associated with eating disorders include a different range of emotional or behavioral problems. Most commonly, associations with other psychiatric disorders and suicidality are observed with eating disorders³. Comorbidity with other psychiatric disorders include mood disorders such as depression, substance use disorders and personality disorders⁴.

Depression and negative body image are prevalent concerns related to eating disorders. Depression is a mood disorder commonly co-occurring with eating disorders and studies indicate that depression is the most common comorbid diagnosis with eating disorders⁵. Lifetime rates of depression in individuals with eating disorders range between 50% and 75%. Furthermore, depression is associated with increased risk for attempted suicide, especially in anorexia nervosa patients⁶. On the other hand, approximately 30% of boys and 60% of adolescent girls report a desire to alter their shape or size⁷. Starting in adolescence, girls are responding to weight concerns by extreme caloric restriction and severe weight control efforts such as purging¹. Over 80% of women in university settings report negative body image⁸. We also know that individuals with an eating disorder have a negative body image and express a desire to be underweight⁹. Especially, anorexia nervosa patients were shown to have high levels of negative and distorted body image¹⁰.

Research has shown that eating disorders typically occur during adolescence which makes it a period of highest vulnerability for young people^{2,11}. Thus, there is evidence that eating disorders are common in university populations with a prevalence ranging from 8% to 17%^{12,13}. Research also shows that eating disorders lead to serious health consequences in the long run, if not treated¹⁴. In fact, eating disorders are being increasingly recognized for mortality in young people besides having some of the highest mortality rates among all psychiatric disorders¹⁵. Therefore, it is of crucial importance to screen for eating disorders in young populations and intervene at an early stage if any signs are present.

The complex relationship between eating attitudes, body image and depression continue to be a significant subject of research and data is being augmented in Western countries. Recent studies demonstrate that eating disorders are also spreading in non-Western countries. Developing countries are continuously being affected by cultural transformation, urbanization and modernization which promote the Western beauty standard of thinness¹⁶. Turkey is one of the developing countries in the world which is affected by urbanization and modernization under the influence of the West. Literature of eating disorders in Turkish society is relatively scarce. It has been hypothesized that there is an increasing occurrence of eating disorders in young population of Turkey due to the effect of industrialization and media exposure of cultural norms of the West. To extend the current literature, this study contributes to the knowledge on the relationships between eating attitudes, body image and depression among Turkish university students aged 18 to 25. It is the aim of this study to raise awareness in the area of eating disorders which may compose a public concern in the future, especially in the young population of the Turkish society.

MATERIALS AND METHODS

Participants

Participants were 301 university students attending different universities. These universities were Bogazici University, Sabanci University and Nisantasi University in Istanbul and Middle East Technical University (METU) in Ankara. Sabanci and Nisantasi universities are private universities. Bogazici and METU are state universities. 221 of participants (73.4%) were female and the remaining 80 (26.6%) were male. In terms of age, 194 (64.5%) participants were in between 18-21 years and the remaining 107 (35.5%) were in between 21-25 years. Inclusion criteria were being a university student and being between the ages of 18-25.

Instruments

Sociodemographic Information Form, Beck Depression Inventory (BDI), Eating Attitude Test (EAT-40) and Body Image Scale were used to collect data.

Eating Attitude Test (EAT-40)

The EAT-40 was developed by Garner and Garfinkel in 1979 to screen and assess the symptoms of anorexia nervosa; but it has been used in nonclinical samples as a general screening measure for abnormal eating attitudes¹⁷. Turkish version of EAT-40 is a likert type scale with 40 items just like the original. The rating range is from 'always' to 'never' and the resulting scores range from 0 to 120. The cut-off score for the scale is 30. Individuals scoring ≥ 30 points are considered to be at high risk for eating disorders. Especially, scores of 33 and above mean that a person probably has pathological eating symptoms. The reported internal consistency of the Turkish version calculated by Cronbach alpha was 0.70¹⁸.

Body Image Scale

Originally named Body-Cathexis Scale, has been developed by Secord and Jourand in 1953. The original scale consists of two parts and has a total of 101 items¹⁹. The Turkish version of the scale is a likert type scale with 40 items (1: I like it very much, 5: I don't like it at all). The resulting scores range from 40 to 200. The cut-off score is 135. High score indicates that the person has an unhealthy perception of body image. Participants who score above 135 are considered to have a negative body image. The reliability and validity study of the scale reported the Cronbach's alpha reliability coefficient as 0,91²⁰.

Beck Depression Inventory

This is a self-report scale which measures the emotional, cognitive and motivational symptoms of depression. It was developed by Beck in 1961. The scale consists of 21 items each containing four alternatives, scored from 0 to 3. The resulting scores range from 0 to 63. The cut-off point is 17. Higher scores in the scale indicate the greater severity of depression. If the total score is below 9, it is regarded as nondepressed (normal), 9-16 mild, 17-29 moderate, 30 and over severe depression, respectively²¹. Turkish adaptation of the scale was done by Hisli in 1988. The split-half reliability

bility was found as 0.74 which makes the scale a valid measure to be used in Turkish population²².

Sociodemographic Information Form

This form was formed by the researchers to gain information about participants such as age, gender, height and weight, university type, academic year (freshman, sophomore, junior, senior), income and education levels of parents. Participants were asked to provide responses to the questions appearing on the form. Body Mass Index of the participants were obtained from the answers that they provided about their height and weight. BMI was calculated using the formula BMI= weight (kg)/height²(m). A BMI below 18.5 was considered as underweight, 18.5-25 normal weight, 25-30 overweight, 30 and over obese, respectively²³.

Procedure and Data Analysis

Participants were informed about the study and written consents were obtained. Data collection took place in the fall semester of the 2017-2018 academic year. Initially, the study included 350 individuals, however 49 participants were excluded from the study due to item non-responses. For statistical analysis, the IBM SPSS version 21.0 package program was used (IBM Corp. released 2012. Armonk, NY, USA).

The data analysis included descriptive statistics, chi-square test, independent samples t-test and Pearson correlation test. Descriptive data were presented in mean or percentage. Chi-square test was conducted to assess the relationship between BMI and gender. Independent samples t-test was used to explore the differences between body image, eating attitude and depression according to gender. It was also used to assess the levels of body image and depression in terms of eating attitudes. In addition, Pearson correlation test was conducted to investigate the relationship between body image, eating attitude and depression according to BMI.

RESULTS

Table 1 presents that 221 (73.4%) participants were female and 80 (26.6%) were male. 194 (64.5%) participants were between the ages of 18-21 and the remaining 107 (35.5%) were between 21-25. In terms of BMI, 39 (13%) participants were considered underweight, 200 (66.4%) were normal weight and 62 (20.6%) were overweight and obese.

Obtained findings show that 115 (38.2%) participants had negative body image and 55 (18.3%) participants had abnormal eating attitudes. While 91 (30.2%) participants showed mild level of depression, 102 (33.9%) showed moderate and severe levels (Table 2).

Chi-square test showed that BMI and gender (p=.029) presented a statistically significant relationship (p<.05). As shown in Figure 1, the percentage of underweight participants in the female group 35 (15.8%) were more than in the male group 4 (5%).

Findings in Table 3 show that there is a statistically significant difference between male and female participants in terms of body image (t=-3.838: p<.001) and depression (t=3.207: p=.001) levels. Female participants had more nega-

Table 1. Sociodemographic characteristics of the sample group.

Variable	Group	n	%	x±sd	min-max
Gender	Female	221	73,4		
	Male	80	26,6		
Age	18-21	194	64,5	21±1.8	18-25
	22-25	107	35,5		
BMI	Underweight	39	13,0		
	200	66,4	22,3±3,9	15,4-37,2	
Normal	Overweight & obese	62	20,6		
Height				169,3±8,6	150-198
Weight				64,2±13,2	42-120
	Total	301	100,0		

n: frequency; %: percentage; x: mean; sd: standard deviation.

Table 2. Levels of body image, eating attitude and depression.

Variable	Group	n	%
Body image	Low (negative)	115	38,2
	Normal	186	61,8
Eating attitude	Normal eating attitude	246	81,7
	Abnormal eating attitude	55	18,3
Depression	Normal	108	35,9
	Minimal	91	30,2
	Moderate and severe	102	33,9
Total	301	100,0	

n: frequency; %: percentage.

tive body image and higher depression levels than male participants. However, they showed no statistically significant difference in terms of eating attitude (t=1.463: p=.145).

As shown in Table 4, students with abnormal eating attitudes statistically significantly showed higher depression levels (t=-2.323: p=.021) compared to students who have normal eating attitudes (p<.05). However, there was no statistically significant body image difference (t=1.885: p=.060) between the two groups (p>.05).

As shown in Table 5, there was a negatively, mild to moderate, statistically significant correlation of body image with eating attitude (r=-.375: p<.05) and depression (r=-.467: p<.01) in the underweight group. Results of the normal weight group showed that body image and depression (r=-

Investigation of the relationships between eating attitudes, body image and depression among Turkish university students

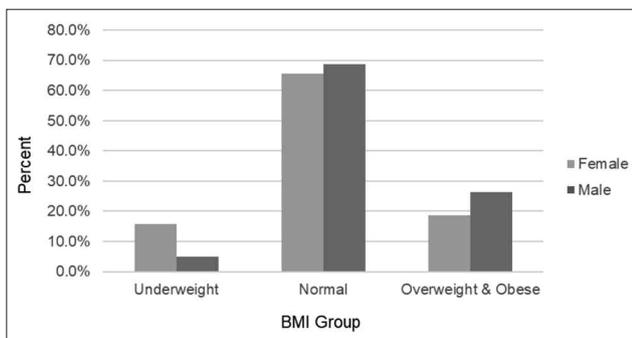


Figure 1 The result of the relationship between BMI and gender.

Table 3. Investigation of body image, eating attitude and depression levels in terms of gender.

Scale	Group	n	x	sd	t	p
Body Image	Female	221	138.8	23.1	-3.838	<.001*
	Male	80	150.3	22.7		
Eating Attitude	Female	221	20.6	13.8	1.463	.145
	Male	80	18.1	9.1		
Depression	Female	221	14.7	8.5	3.207	.001*
	Male	80	11.2	8.2		

*Independent samples t test.

Table 4. Investigation of body image and depression levels in terms of eating attitude groups.

Scale	Group	n	x	sd	t	p
Body image	Normal eating attitude	246	143.1	22.8	1.885	.060
	Abnormal eating attitude	55	136.5	26.1		
Depression	Normal eating attitude	246	13.3	8.5	-2.323	.021*
	Abnormal eating attitude	55	16.2	8.4		

*Independent samples t test.

.522: $p < .01$) were negatively, moderate and statistically significantly correlated; but eating attitude did not show a statistically significant linear association with body image and depression ($p > .05$). Results of the overweight and obese group were similar to that of the normal weight group. While body image and depression were negatively, moderate to good and statistically significantly correlated ($r = -.647$: $p < .01$), eating attitude had no statistically significant correlation with body image and depression ($p > .05$) (Table 5). A visualization of the results of the Pearson's correlation analysis is presented in Figure 2. Each graph shows the results of the analysis pertaining to the relevant BMI group. The direc-

Table 5. Investigation of the relationships between body image, eating attitude and depression.

BMI (Group)		Body Image	Eating Attitude	Depression
Underweight	Body image	1		
	Eating attitude	-.375*	1	
	Depression	-.467**	.274	1
Normal	Body image	1		
	Eating attitude	-.077	1	
	Depression	-.522**	.102	1
Overweight & obese	Body image	1		
	Eating attitude	.001	1	
	Depression	-.647**	.076	1

* $p < .05$, ** $p < .01$, p indicates significance

tion and the strength of the relationships are indicated by a color scale and nonsignificant results are crossed out for clarity. Change in color from darker to lighter indicates an increase towards a positive correlation and the intensity of the color signifies the strength of the correlation. As shown in Figure 2, although not statistically significant, there is a positive correlation between eating attitude and depression, with the strength of the correlation decreasing from the underweight group to normal to overweight and obese.

This study further investigated the levels of eating attitude, body image and depression in terms of university type, academic year (freshman, sophomore, junior, senior), income and education level of parents. For the sake of brevity, the related tables are not included in the paper. The results revealed that body image was significantly more negative ($t = -3.118$: $p = .002$), and depression was significantly higher ($t = 2.702$: $p = .007$) in participants who attended private universities compared to state universities ($p < .01$). It was further obtained that abnormality in eating attitudes ($F = 2.830$: $p = .039$) of participants increased as the income level of parents increased ($p < .05$). There were no statistically significant differences in the eating attitude, body image and depression levels of the students in terms of academic year, education level of parents and BMI of the students.

DISCUSSION

In this study, underweight participants (15.8%) were significantly more in the female group than in the male (5%) according to their BMI. A cross-sectional study conducted by Mikolajczyk et al. showed that underweight females were more than males in Turkey²⁴. Further, underweight females were highly prevalent in both Slavic countries (Poland and Bulgaria) and in Turkey. A study conducted in Turkey also has a similar result showing that being 18.5 and below (underweight) according to BMI was higher among females²⁵. Literature suggests that women are more affected by the

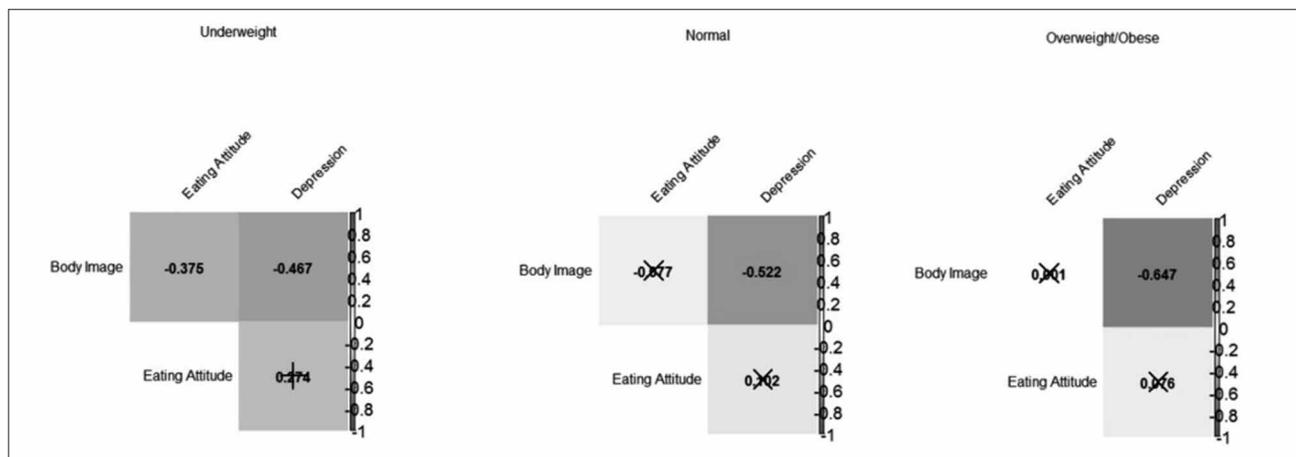


Figure 2 Pearson's correlation analysis showing the relationships between body image, eating attitude and depression according to groups of underweight, normal and overweight/obese.

'thin ideal' and research shows that women have more experience with dieting²⁶. Therefore, this could indicate that Turkish female university students give more importance to being thin compared to males.

According to the results of this study, females had more negative body image than males which means that they were more dissatisfied with their body image compared to males. Previous studies show that women and adolescent girls experience higher levels of body image dissatisfaction than men²⁷. A study which investigated body weight and shape dissatisfaction found that among undergraduates, there was more body dissatisfaction among female students compared to male students, and female students who are even at a normal weight wished to have a thinner body²⁸. Consistent with our results, another study conducted in Turkey also revealed that female university students had more negative body image than male students²⁹.

Obtained findings further presented that females presented significantly higher depression levels than males. Literature in this area present the most substantial number of findings. Estimates are that twice as many women as men are depressed³⁰. Studies concerning depression levels of university students revealed that females were significantly more depressed or more likely to be depressed than males^{31,32}. However, a study which looked at eating attitudes and depression levels of Turkish university students found contradictory results. Unlike our findings, gender did not lead to any significant difference in the depression levels of the students³³. Contrary to that study, our findings did not present a significant gender difference in terms of eating attitudes of the participants. This may be caused by the unique characteristics of the participants and may be related to the increasing shift in gender roles in Turkish population. Men and women may now be subject to similar expected terms in their societal roles.

Results of this study revealed that 18.3% of our participants who were either in Istanbul or Ankara which are the top industrialized cities of Turkey presented abnormal eating attitudes indicating high risk for eating disorders. A study conducted by Bas and colleagues investigated eating atti-

tudes and their psychological correlates among Turkish young people³⁴. Among 783 students, 11.5% of them showed abnormal eating attitudes which indicate high risk for eating disorders. They did not investigate into depression or body image³⁴. A different study which was conducted by Buyukgoze-Kavas investigated eating attitudes and depression in Turkish university students³³. 269 participants were included and 12.3% of them presented high risk for eating disorders. That study did not evaluate body image or BMI³³. Kutlu and Civi investigated eating habits, body perception and depression status of 262 university students²⁵. Body perception was obtained only by asking participants' ideas about their own weight. Results of that study showed that only 5% of participants had abnormal eating attitudes²⁵. However, unlike the previously mentioned studies, it was noticed that students from Vocational Education Faculty of a university in Central Anatolia which is a relatively rural part of Turkey were included in this study. Similarly, Akdevelioglu and Gumus conducted a research related to the eating attitudes and body image of university students and found that 5.9% of 577 students had abnormal eating attitudes³⁵. Their participants were also attending Vocational Education Faculty of a state university³⁵. Typically, those students come from low income families and live in unindustrialized cities of Turkey. It can be inferred that eating disorders would be relatively low among those populations. Hence, obtained low percentages may be due to such characteristics of the participants.

Moreover, a main finding of this study shows that body image was negatively, mild to moderate, statistically significantly correlated with eating attitude and depression in the underweight group. Since Eating Attitude Test (EAT-40) measured abnormality of eating attitude in the anorexia nervosa direction, it is not surprising to see this correlation solely in the underweight group. Considering that anorexia nervosa is more common in women³⁶ and the female percentage was more in the underweight group in this study, these results are coherent with the existing literature about the relationships between body image, eating disorder and depression, especially in women³⁷. The complex interrelationship of negative body image, depression and eating disorders have

Investigation of the relationships between eating attitudes, body image and depression among Turkish university students

long been the subject of research and theoretical models of eating disorders have scrutinized on the significant role of depression, but the nature of this role is still not certain ('depression is a sequelae of eating disorders or vice versa' and 'eating disorder is an expression of depression')³⁸. Some studies emphasize that depression is acting as a mediator in this relationship^{37,39}. According to Jonstang's theoretical model, depression is described as a mediator for body image and eating disorders among adolescents in Norway³⁹. The literature in Turkish society is not conclusive and further research is needed to model this complex relationship among Turkish population.

Moreover, the results of the other BMI groups (normal, overweight & obese) demonstrated a negative correlation between body image and depression, but not eating attitude. This may be due to again the nature of the EAT-40 which measures abnormality towards anorexia nervosa. Literature suggests that overweight and obese people tend to have either binge eating disorder or night eating syndrome which contribute to their overweight⁴⁰. Nonetheless, it is important to underline the significant correlation between depression and body image among all the BMI groups, especially the increase in the strength of the correlation from underweight to normal to overweight and obese groups. There is substantial evidence in the literature about the relationships between depression and body image with BMI. People with higher BMI usually report high levels of depression and negative body image and eating disorders may result from obesity experienced during childhood and teenage years⁴¹. Increased BMI is a known predictor of disordered eating as well⁴². Therefore, it is important to recognize increased BMI in young individuals as one of the possible signs of future eating pathology.

This study found that individuals with abnormal eating attitudes showed significantly higher levels of depression compared to students who have normal eating attitudes, but they did not differ in terms of body image which was unexpected. One reason for this might be that the sample of this study is going through a unique experience which led to a more acceptance of their body image or another unknown culture-specific reason which needs to be further investigated. On the other hand, results of this study are consistent with the literature concerning the association between eating disorders and depression. For instance, a study which focused on university students in Malaysia, found that students who were susceptible to depression were more susceptible to eating disorders³⁷.

Although it cannot be generalized, eating disorders seem to be more common among high-income families. Our results also revealed that abnormality in eating attitudes of participants increased as the income level of their parents increased. Considering that eating disorders are more prevalent in industrialized regions, these results make sense since Istanbul and Ankara are highly developed cities of Turkey. Therefore, the jobs of parents are more in the service sector rather than agriculture and livestock as in the Central and Eastern Anatolia. It can be inferred that typically income levels of parents are higher. Especially, students who attend private universities usually come from high-income families. Therefore, our results showing that body image was more negative and depression was higher in participants who attended private universities may be explained by this. Manaf and colleagues also attributed the high levels of depression

among female university students to the fact that their study was conducted in a private university³⁷. These results can be an indicator of high risk for developing eating disorders in a population which display similar characteristics.

It is known that more than 90% of the eating disorder cases occur among individuals who are at or below the age of 25⁴³ and the prevalence is particularly high among college students¹². In our study, this percentage was 18.3% and the participants were university students aged 18 to 25. Addressing eating pathology in college populations is particularly important because young people are going through a rapid change during the transition from compulsory schooling into further education. Adjustment to university life can be very challenging including issues related to residential life, academic pressure, extracurricular activities or social life which exacerbate the risk of developing psychiatric disorders including eating or mood disorders⁴⁴. Therefore, understanding college youth who are not receiving clinical care can be helpful in the early detection and treatment of eating disorders which also increases the chances of full recovery⁴⁵. This information can assist the development and implementation of effective campus-level prevention, detection, and intervention strategies. Efforts should be made towards implementing school-based interventions to support healthy eating patterns of young people and improving health services within universities by which students with untreated eating pathology can be reached.

The literature about eating disorders in Turkish population is still very limited, hence the prevalence of eating disorders is yet uncertain. Considering that Turkey has been in a transition period towards the West, many aspects have been affected such as attitudes, values, gender roles and lifestyles. The rapid change of globalization in these aspects has influenced the society profoundly especially through media. In the last decades, the idea that being thin is the sign of beauty is being accepted by university students even in the rural parts of Turkey⁴⁶ even though the cultural definition of beauty in those regions had long been associated with being full-figured. From a cultural point of view, it can be said that there is a concerning increase in the risk of developing eating disorders in Turkey especially among young generation. Further research is needed to determine the prevalence rate and comorbidity of eating disorders in Turkish society.

CONCLUSIONS

It is important to underline that all of the measurement tools were self-reporting which creates a limitation to the study and the sample of the study reflects the attitudes of a certain group of young people who live in large cities of Turkey, attend specific schools and hold specific cultural norms. Including larger samples from socio-demographically more diverse populations in Turkey should be taken into consideration for further research. In addition, the conclusions were based on correlations and do not provide information on the causal mechanisms which need to be further investigated with longitudinal studies.

This study concluded that 18.3% of the 301 students had abnormal eating attitudes which indicate high risk for eating disorders. While 115 (38.2%) students had negative body im-

age, 102 (33.9%) students showed moderate and severe levels of depression. Underweight participants were more in the female group. Females also had more negative body image and higher depression levels than males. Gender and BMI did not lead to any difference in the eating attitudes of the students. Body image was negatively correlated with eating attitude and depression in the underweight group. Individuals with abnormal eating attitudes had higher depression levels. This study has contributed to the literature on the relationships between eating attitudes, body image and depression among Turkish university students aged between 18 and 25. It has further drawn attention to the importance of eating disorders in Turkey and being aware of the relationships between eating attitudes, body image, depression and BMI.

Conflict of interests: the authors have no conflict of interests to declare.

REFERENCES

1. Grabe S, Hyde JS. Ethnicity and body dissatisfaction among women in the united states: a meta-analysis. *Psychol Bull* 2006; 132: 622-40.
2. Striegel-Moore RH, Bulik CM. Risk factors for eating disorders. *Am Psychol* 2007; 62: 181-98.
3. Swanson SA, Crow SJ, Le Grange D, Swendsen J, Merikangas KR. Prevalence and correlates of eating disorders in adolescents: results from the national comorbidity survey replication adolescent supplement. *Arch Gen Psychiatry* 2011; 68: 714-23.
4. Sharan P, Sundar AS. Eating disorders in women. *Indian J Psychiatry* 2015; 57 (suppl 2): S286-95.
5. Bersani G, Bersani FS, Prinziavalli E, et al. Premorbid circadian profile of patients with major depression and panic disorder. *Riv Psichiatri* 2012; 47: 407-12.
6. Mischoulon D, Eddy KT, Keshaviah A, et al. Depression and eating disorders: treatment and course. *J Affect Disord* 2011; 130: 470-7.
7. Lawler M, Nixon E. Body dissatisfaction among adolescent boys and girls: the effects of body mass, peer appearance culture and internalization of appearance ideals. *J Youth Adolesc* 2011; 40: 59-71.
8. Myers TA, Crowther JH. Sociocultural pressures, thin-ideal internalization, self-objectification, and body dissatisfaction: could feminist beliefs be a moderating factor? *Body Image* 2007; 4: 296-308.
9. Pritts SD, Susman J. Diagnosis of eating disorders in primary care. *Am Fam Physician* 2003; 67: 297-304.
10. Keizer A, Smeets MAM, Dijkerman HC, et al. Tactile body image disturbance in anorexia nervosa. *Psychiatry Res* 2011; 190: 115-20.
11. Quartini A, Pacitti F, Bersani G, Iannitelli A. From adolescent neurogenesis to schizophrenia: opportunities, challenges and promising interventions. *Biomedical Reviews* 2017; 28: 66-73.
12. Tavoracci MP, Grigioni S, Richard L, Meyrignac G, Déchelotte P, Ladner J. Eating disorders and associated health risks among university students. *J Nutr Educ Behav* 2015; 47: 412-20.
13. Riccobono G, Pompili A, Iannitelli A, Pacitti F. The relationship between Night Eating Syndrome, depression and chronotype in a non-clinical adolescent population. *Riv Psichiatri* 2019; 54: 115-9.
14. Le Grange D, Lock J. Eating disorders in children and adolescents: a clinical handbook. New York: Guilford Press, 2011.
15. Hoang U, Goldacre M, James A. Mortality following hospital discharge with a diagnosis of eating disorder: national record linkage study, England, 2001-2009. *Int J Eat Disord* 2014; 47: 507-15.
16. Smink FR, Van Hoeken D, Hoek HW. Epidemiology of eating disorders: incidence, prevalence and mortality rates. *Curr Psychiatry Rep* 2012; 14: 406-14.
17. Garner DM, Garfinkel PE. The eating attitudes test: an index of the symptoms of anorexia nervosa. *Psychol Med* 1979; 9: 273-9.
18. Savasir I, Erol N, Yeme Tutumu Testi. Anoreksiya nevroza belirtileri indeksi. *Psikoloji Dergisi* 1989; 7: 19-25.
19. Secord PF, Jourard SM. The appraisal of body-cathexis: body-cathexis and the self. *J Consult Psychol* 1953; 17: 343-7.
20. Hovardaoglu S. Vucut algisi olcegi. *Psikiyatri, Psikoloji, Psiko-farmakoloji (3P) Dergisi* 1993; 1: 26.
21. Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh, J. An inventory for measuring depression. *Arch Gen Psychiatry* 1961; 4: 561-71.
22. Hisli N. A study on the validity of the beck depression inventory. *Turk Psychol J* 1998; 6: 118-23.
23. Body mass index - BMI. (2019). Retrieved from: <https://bit.ly/32xqnDt>
24. Mikolajczyk RT, Maxwell AE, El Ansari W, Stock C, Petkeviciene J, Guillen-Grima F. Relationship between perceived body weight and body mass index based on self-reported height and weight among university students: a cross-sectional study in seven European countries. *BMC Public Health* 2010; 10: 40.
25. Kutlu R, Civi S. Evaluation of eating habits, body perception and depression status of university students. *Gulhane Medical Journal* 2013; 55: 196-202.
26. Keel PK, Baxter MG, Heatherton TF, Joiner TE Jr. A 20-year longitudinal study of body weight, dieting, and eating disorder symptoms. *J Abnorm Psychol* 2007; 116: 422-32.
27. Holland G, Tiggemann M. A systematic review of the impact of the use of social networking sites on body image and disordered eating outcomes. *Body Image* 2016; 17: 100-10.
28. Neighbors LA, Sobal J. Prevalence and magnitude of body weight and shape dissatisfaction among university students. *Eat Behav* 2007; 8: 429-39.
29. Sanlier N, Turkozu D, Toka O. Body image, food addiction, depression, and body mass index in university students. *Ecol Food Nutr* 2016; 55: 491-507.
30. Hyde JS, Mezulis AH, Abramson LY. The ABCs of depression: Integrating affective, biological, and cognitive models to explain the emergence of the gender difference in depression. *Psychol Rev* 2008; 115: 291-313.
31. Young CB, Fang DZ, Zisook S. Depression in Asian-American and Caucasian undergraduate students. *J Affect Disord* 2010; 125: 379-82.
32. Ghodasara SL, Davidson MA, Reich MS, Savoie CV, Rodgers SM. Assessing student mental health at the vanderbilt university school of medicine. *Acad Med* 2011; 86: 116-21.
33. Buyukgoze-Kavas A. Eating attitudes and depression in a Turkish sample. *Eur Eat Disord Rev* 2007; 15: 305-10.
34. Bas M, Asci FH, Karabudak E, Kiziltan G. Eating attitudes and their psychological correlates among Turkish adolescents. *Adolescence* 2004; 39: 593-9.
35. Akdevelioglu Y, Gumus H. Eating disorders and body image perception among university students. *Pakistan Journal of Nutrition* 2010; 9: 1187-91.
36. Arcelus J, Mitchell AJ, Wales J, Nielsen S. Mortality rates in patients with anorexia nervosa and other eating disorders: a meta-analysis of 36 studies. *Arch Gen Psychiatry* 2011; 68: 724-31.
37. Manaf NA, Saravanan C, Zuhrah B. The prevalence and inter-relationship of negative body image perception, depression and susceptibility to eating disorders among female medical undergraduate students. *J Clin Diagn Res* 2016; 10: VC01-VC04.
38. Fairburn CG, Brownell KD (eds). Eating disorders and obesity: a comprehensive handbook, 2nd edn. New York: Guilford Press, 2002; 193-8.
39. Jonstang IC. The effect of body dissatisfaction on eating disorder symptomatology: mediating effects of depression and low self-esteem: a partial test of the Dual-Pathway Model. MS thesis, 2009.

Investigation of the relationships between eating attitudes, body image and depression among Turkish university students

40. Stunkard AJ. Eating disorders and obesity. *Psychiatr Clin North Am* 2011; 34: 765-71.
41. Mintem GC, Gigante DP, Horta BL. Change in body weight and body image in young adults: a longitudinal study. *BMC Public Health* 2015; 15: 222.
42. Keel PK, Fulkerson JA, Leon GR. Disordered eating precursors in pre- and early adolescent girls and boys. *J. Youth Adolesc* 1997; 26: 203-16.
43. Deering S. Eating disorders: recognition, evaluation, and implications for obstetrician/gynecologists. *Prim Care Update Ob Gyns* 2001; 8: 31-5.
44. Pedrelli P, Nyer M, Yeung A, Zulauf C, Wilens T. College students: mental health problems and treatment considerations. *Acad Psychiatry* 2015; 39: 503-11.
45. Becker AE, Franko DL, Nussbaum K, Herzog DB. Secondary prevention for eating disorders: the impact of education, screening, and referral in a college-based screening program. *Int J Eat Disord* 2004; 36: 157-62.
46. Kugu N, Akyuz G, Dogan O, Ersan E, Izzic F. The prevalence of eating disorders among university students and the relationship with some individual characteristics. *Aust N Z J Psychiatry* 2006; 40: 129-35.