



Impact of Perceived Body Weight on Depression, Anxiety and Stress Levels of Young Adults in Turkey

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Abstract

Background: The desire to attain ideal body dimensions determined by the society causes internal pressure and negative emotional intensity in young people, and this leads to mood disorders. It was aimed to examine the relationship between university students' perceived body weights and their depression, anxiety, and stress levels.

Methods: This cross-sectional, descriptive study was conducted with 950 university students at Uskudar University in Istanbul, Turkey during the 2021-2022 academic year. The Information Form and the Depression, Anxiety and Stress Scale (DASS-42) were administered online through a structured questionnaire created in Google Forms. IBM SPSS v26® software was used in the analysis of the data.

Results: 74.4% of the students were female. The mean age was 19.17 ± 1.11 years, and the mean body mass index (BMI) was 22.12 ± 3.87 kg/m². The prevalence of participants' mood disorders as 'severe' and 'extremely severe' depression was 91.2%, anxiety was 62.2% and stress was 62.3%. According to BMI, 26.1% of 'underweight' students and 31.5% of 'overweight' students perceived themselves as normal weight. And also, 23.8% of the students misjudged their body weight. Students who misjudged their body weight had higher depression levels ($P=0.008$).

Conclusion: There was a strong relationship between perceived body weight and depression, 1 of every 4 students misjudged their body weight. Body perception of participants who were 'underweight' according to BMI was in the perceptual direction of obesity and who were 'overweight' was in the perceptual direction of thinness. Students who were 'normal weight' according to BMI have a healthier body image.

Keywords: Body image; Depression; Anxiety; Stress disorders; Body mass index

Introduction

As a social being, man attaches importance to the impression he leaves on others in almost every field throughout his life. The importance given to good-looking has brought with it the desire to be nice and admired. This perception is imposed on

individuals, families and society, especially through the media (1).

While people develop various feelings and attitudes about their bodies according to the ideal measures presented to them, deviation from ideal



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measures leads to changes in the individual's self-assessment and moods. Because perceiving individual's body and attributing certain meanings to it is closely related to psychological well-being (2). Individuals who evaluate themselves/their bodies positively are more confident in interpersonal relations and more successful in their work, on the other hand, those who do not like themselves/their bodies and think that they have flaws, at some point in their life or on an ongoing basis face mood disorders such as depression, anxiety and stress associated with negative emotions such as restlessness, desperation etc. (3).

The early adulthood/youth period (18-24 age group) is a contradictory period which many changes are experienced in emotional, physical and social terms, and an effort to find an identity in psychosocial terms continue. Therefore, youngsters are more prone to emotional and mental problems (4). In youngsters, body image dissatisfaction is frequently encountered due to the emphasis on appearance (5). Body image dissatisfaction occurs when there is a difference between the individual's "current body", "perceiving body" and "desiring body" (6). In other words, youngsters who cannot assess their body weight correctly may perceive themselves as overweight even though they are underweight, or as underweight even though they are overweight (7). For this reason, the desire to attain ideal body dimensions determined by the society causes internal pressure and intense negative emotions among young people, which in turn leads to the emergence of mood disorders (8).

The emotional, mental and physical health of today's youngsters who will be the adults of future, is important in protecting and maintaining the health of the community. It was aimed to examine the relationship between university students' perceived body weights and their depression, anxiety, and stress levels.

Materials and Methods

The population of the cross-sectional, descriptive study was 22.662 students at Uskudar University

in Istanbul, Turkey during the 2021-2022 academic year. For the sample, 95% confidence interval from the study population was calculated with a 5% margin of error and the participation of 378 students would be sufficient. Nevertheless the sample consists of 950 students who accepted to participate in the study and provided complete information.

Ethics Committee Approval, numbered 61351342/2021-48 and dated 30.12.2021, was obtained from Uskudar University Non-Interventional Research Ethics Committee.

The inclusion criteria for the study were as follows: being over the age of 18, being enrolled at Uskudar University in the 2021-2022 semester, not having a health problem that prevents reading comprehension, consenting to participate in the study and answering the questions completely. Exclusion criteria were not meeting the inclusion criteria.

Data Collection

Data was collected with a Information Form which questioning demographic characteristics (such as age, gender, anthropometric measurements, individuals' evaluations of body weight perception and general mood) and a Depression Anxiety Stress Scale (DASS-42) together; all were created in Google Forms and applied online between January and February 2022, due to the Covid-19 pandemic process.

Depression, Anxiety and Stress Scale (DASS-42)

DASS-42 which included to 42-items, was created by Lovibond and Lovibond in 1995, and its validity and reliability studies were carried out by Akın and Çetin (9). It is a 4-point Likert-type scale consisting of 42 items, 14 of which belong to depression, 14 to anxiety, and 14 to stress sub-dimensions. The DASS-42 indications for severity levels of mood disorders are as follows. The range of 0-9 is considered as normal, the range of 10-13 is mild, the range of 14-20 is moderate, the range of 21-27 is severe and 28+ is extreme severe depression. The range of 0-7 is in the range of normal, 8-9 is mild, 10-14 is moderate, 15-19 is severe, and

20+ is extreme severe anxiety. The range of 0-14 is deemed as normal, the range 15-18 is mild, the range 19-25 is moderate, the range 26-33 is severe, and the range 34+ is extreme severe stress (9).

Body Mass Index (BMI) rating

Due to the COVID-19 pandemic, the heights and body weights of the participants are based on the self-reports of the individuals. Students' BMI values were calculated with the formula "body weight (kg)/height (m)² squared (kg/m²)" and classified according to World Health Organization (WHO)'s BMI classification. BMI classification was made as follows; <18.5 kg/m² "underweight", 18.5-24.9 kg/m² "normal", 25.0-29.9 kg/m² "overweight", >30 kg/m² "obese" (10).

Data Analyses

Descriptive statistics for categorical variables were presented as frequency and percentage. The conformity of the numerical variables to the normal distribution was checked with the "Shapiro-Wilk Test". The mean and standard deviation results were given for those whose descriptive statistics of numerical variables show normal distribution. In the comparison of two independent groups, since the data confirmed the assumptions of the parametric tests, the "Independent Sample *t*-test" was used. Examination of the relationships between the scales was determined with the "Pearson Product-Moment Correlation Coefficient". The hypotheses were established as bidirectional. Statistical analysis of the data was performed with SPSS version 26 statistical analysis software (IBM Corp., Armonk, NY, USA).

Results

Of the 950 university students who participated in the study, 74.4% were female. The mean age was

19.17±1.11 years, and the mean BMI was 22.12±3.87 kg/m². According to BMI classification, 11.7% of participants were "underweight" (<18.5 kg/m²), 71.3% were "normal" (18.5-24.9 kg/m²) and 17% were "overweight". Since the number of participants in the 'obese' group according to the BMI classification was a small number, so they were included in the "overweight" group and statistical analyzes were made. It was reported by 71.2% of the participants, that their daily sleep duration was between 7-9 hours and 36.2% of the participants reported doing 150 minutes or more of physical activity per week in line with WHO recommendations. Only 7% of the participants resided in dormitories, while 17% stated that their income was below their expenses. 22.9% of the participants reported that they were "very inactive", also 82.4% of the participants stated their general mood as "negative". In this study 82.4% of the participants stated their general mood as "negative". The prevalence of participants' mood disorders as "severe" and "extremely severe" depression was 91.2%, anxiety was 62.2% and stress was 62.3% according to DASS-42 evaluation (Table 1).

According to the BMI classification, 26.1% of the participants who were "underweight" evaluated themselves as normal weight; 7.1% of the participants who were "normal" perceived themselves as underweight and 14.3% of the participants who were "normal" evaluated themselves as overweight and also 31.5% of the participants who were "overweight" perceived themselves as normal weight (Table 2). Starting from this, 23.8% of the participants misjudged their body weight according to BMI when 76.2% of the participants correctly their body weight according to BMI.

Table 1: Demographic characteristics of the students and findings related to the evaluation of DASS-42

<i>Variable</i>	<i>N</i>	<i>%</i>
Gender		
Male	243	25.6
Female	707	74.4
Age (years) ($\bar{X} \pm SS$)	19.17±1.11	
BMI ($\bar{X} \pm SS$)	22.12±3.87	
Underweight (<18.5 kg/m ²)	111	11.7
Normal (18.5-24.9 kg/m ²)	677	71.3
Overweight/Obese (>25.0 kg/m ²)	162	17.0
Sleep Duration		
<7 hour	164	17,3
7-9 hour	676	71,2
>9 hour	110	11,5
Physical activity >150 min/week in line with WHO recommendation		
Yes	350	36,8
No	600	63,2
Place of Residence		
Home with family	716	75,4
Home alone or with friends	167	17,6
Student dormitory	67	7,0
Economic Situation		
“My expenses are higher than my income”	162	17,0
“My income is equal to my total expenses”	644	67,8
“My income is under my expenses”	144	15,2
General Mood Rating Status		
Positive	110	11.6
Negative	783	82.4
Changeable	57	6.0
The Evaluation of DASS-42		
Depression Status		
Moderate	83	8.8
Severe	178	18.7
Extremely severe	689	72.5
Anxiety Status		
Moderate	359	37.8
Severe	277	29.2
Extremely severe	314	33.0
Stress Status		
Mild	149	15.7
Moderate	209	22.0
Severe	327	34.4
Extremely severe	265	27.9

DASS-42 Depression, Anxiety and Stress Scale; BMI Body Mass Index

Table 2: Body weight perception status of students according to BMI classification

<i>Variable</i>	<i>Body Weight Perception Status</i>						<i>Total</i>	
	<i>Underweight</i>		<i>Normal</i>		<i>Overweight</i>			
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
BMI Classification								
Underweight (<18.5 kg/m ²)	82	73.9	29	26.1	-	-	111	100
Normal (18.5-24.9 kg/m ²)	48	7.1	532	78.6	97	14.3	677	100
Overweight/Obese (>25.0 kg/m ²)	1	0.5	51	31.5	110	67.9	162	100

There was no statistically significant difference in the levels of depression ($P=0.312$), anxiety ($P=0.605$) and stress ($P=0.077$) in university students according to gender, although the mean scores of female students were higher than males. Even though, there was no significant relation between the age of university students and their depression ($P=0.857$), anxiety ($P=0.579$) and stress ($P=0.269$) levels. Statistically significant very weak positive correlations were found between university students' BMI with their depression ($r=0.075$, $P=0.021$) and anxiety ($r=0.067$, $P=0.039$) levels. With increasing the BMI of the university students

there was a 7.5% increase in the depression level, a 6.7% increase in the anxiety level. A statistically significant difference was found in the depression ($P=0.000$), anxiety ($P=0.000$) and stress ($P=0.000$) levels of the university students according to their general mood evaluation. The mean scores of students who evaluated general mood as “positive” were lower than those who evaluated mood as “changeable”. Depression ($P=0.008$) levels of university students who perceived misjudged their body weight according to BMI, were found to be statistically significantly higher than those who perceived their body weight correctly (Table 3).

Table 3: Comparison of DASS-42 sub-dimension scores according to students' demographic characteristics and body weight perception

<i>Variable</i>	<i>Depression</i> $\bar{X} \pm SS$	<i>Anxiety</i> $\bar{X} \pm SS$	<i>Stress</i> $\bar{X} \pm SS$
Gender			
Male	27.66±10.56	23.88±8.08	27.68±9.59
Female	27.89±10.02	24.19±8.01	28.90±9.16
	t=1.012	t=-0.518	t=-1.768
	P=0.312	P=0.605	P=0.077
Age (yr)	r=0.006	r=-0.018	r=0.036
	P=0.857	P=0.579	P=0.269
BMI (kg/m ²)	r=0.075	r=0.067	r=0.033
	P=0.021	P=0.039	P=0.314
General Mood Rating Status			
Positive	22.64±8.40 ^a	21.03±6.92 ^a	25.22±7.96 ^a
Negative	27.13±9.89 ^{ab}	24.10±7.76 ^{ab}	28.61±9.15 ^{ab}
Changeable	35.14±11.93 ^b	30.25±9.92 ^b	34.82±10.29 ^b
	F=30.208	F=26.112	F=20.959
	P=0.000	P=0.000	P=0.000
Body Weight Perception Status			
Evaluating correctly according to BMI	26.60±10.27	23.89±8.16	28.48±9.51
Evaluating misjudged according to BMI	28.64±9.68	24.83±7.53	28.94±8.52
	t=-2.639	t=-1.540	t=-0.644
	P=0.008	P=0.124	P=0.519

DASS-42 Depression, Anxiety and Stress Scale, BMI Body Mass Index
t Independent Sample T-Test, F One-Way ANOVA Test, r Pearson Product Moments Correlation Coefficient
The difference between means without a common letter was significant

Discussion

In this study, approximately 9 out of every 10 participants had depression; 6 of them had anxiety and 6 of them had stress according to DASS-42 evaluation as ‘severe’ and ‘extremely severe’ levels.

Similarly, in studies conducted on university students during the COVID-19 pandemic, approximately half of the students showed a ‘moderate’ to ‘severe’ level of depression and 2 out of the 5 stu-

dents showed a 'moderate' to 'severe' level of anxiety in the USA (11); approximately 1 out of 3 students had 'moderate' to 'extremely severe' depression and anxiety levels and that 1 out of every 4 students had "severe" stress level in Germany (12). Approximately half of the students had various levels of anxiety in China (13). In Turkey university students who were remotely educated during prolonged COVID-19 pandemic, approximately 5 out of every 10 students had depression, 6 of them had anxiety and 7 of them had stress according to DASS-21 evaluation respectively (14). On the other hand, in a study that analyzed the data of more than 25,000 university students between 2013 and 2017 before the COVID-19 pandemic, only 6.2% of the participants had 'severe' and 'extremely severe' levels of depression and anxiety (15). In studies conducted during the COVID-19 pandemic, depression, anxiety, and stress levels are quite high compared to the pre-pandemic study. This situation can be explained by the negative effects caused by the prolonged period of the COVID-19 pandemic.

In the present study, approximately 3 out of every 4 participants who were 'underweight' according to BMI evaluated their body weight correctly, while 1 out of 4 participants perceived themselves as overweight. In addition, approximately 2 out of 3 participants who were 'overweight' according to BMI evaluated their body weight correctly, while 1 out of 3 participants perceived themselves as underweight. Consequently, approximately 1 out of every 4 participants had misjudged their body weight. Similarly, according to the 'Turkey Body Weight Perception Survey', 1 out of every 3 participants who were 'underweight' according to BMI and half of the participants who were 'overweight' according to BMI, perceived themselves as normal weight (16). About half of the students who were 'underweight' according to BMI and 1 out of 5 students who were 'overweight' or 'obese' evaluated themselves as normal weight (17). On the other hand, nearly half of the participants who were 'normal' according to BMI considered themselves as overweight and that negative body image was related to the perceived body weight rather than the actual weight of the individual (18). In

another study, approximately half of the participants who were 'normal' or 'obese' according to BMI perceived themselves as overweight on the Body Image Scale (19). From this point of view, body perception deteriorates in the direction of obesity in thin students and in the direction of thinness in obese students. This situation could be explained by the fact that body image may be incompatible with the individual's real structure and people who stay at the same body weight even if their body weight was high or low for a long time, they now adopt to this situation and normalize it, and therefore they could begin to evaluate themselves as normal.

In this study, female students' depression, anxiety and stress levels were higher than males, but it was not statistically significant. Studies conducted in different countries show that women have higher depression, anxiety and stress levels than men (20, 21). Ramachandran theorized that, coping could be divided into 'problem-focused coping' and 'emotion-focused coping'. Problem-focused coping strategy, is used to change the source of stress and this strategy is common in men on the other hand emotion-focused coping strategy is used when the individual believes that the source of stress cannot be changed and must be tolerated, and this strategy is common in women. Emotion-focused coping strategy paves the way for mood disorders such as depression, anxiety, and stress (22). The fact that mood disorders are more common in women can be explained by this strategy.

In the present study, with increasing age, depression and stress levels increased, while anxiety levels decreased but they were not statistically significant. The increase in depression and stress levels is associated with the increase in age (23). In the results of the "Turkey Addiction Risk Profile and Mental Health Map Project Final Report 2019", the level of anxiety decreased with increasing age (24). This can be explained by the fact that with the increase in age, standing on individual's own feet and increasing sense of responsibility cause the individual to feel more depressed and stressed with the pressure it creates on psychology of individual. On the other hand, the decrease in anxiety with increasing age can be explained by the clarity

of some situations of in individual's life and the fact that individuals have gained experience with the events and situations individuals encounter.

In this study, with increasing BMI, also depression and stress levels increased. Similarly, in studies conducted with university students, depression (25), stress (26), and anxiety (27) levels increase with an increase in BMI. This situation may be associated with a decrease in self-confidence and individual's body satisfaction, in contrast to the increasing the individual's body weight. Therefore, this situation can be explained by the negative reflection of the individual's mood disorders.

In this study, depression, anxiety and stress levels of students who evaluated general mood as positive were found to be lower than students who evaluated mood as changeable. Similarly, it was reported that positive perception had a negative relationship with depression score and had a positive relationship with psychological well-being (28). Another study found a positive relationship between psychological well-being and depression, anxiety, and stress (29). This situation can be explained that, university students who are in a positive mood, determine their goals and progress in that way, realize the resources they have and use these resources, focus on the solution rather than the problem, and discover their positive aspects cause have a positive effect on their psychological well-being and therefore their mood.

In the present study, depression levels of students who misjudged their body weight were found to be higher than those who evaluated their body weight correctly. Anxiety and stress levels of students who misjudged their body weight were found to be higher than those who evaluated their body weight correctly but they were not statistically significant. Examinations in the literature have reported that the negative view of the body image is associated with depression and mood disorders (30, 31). On the other hand, in Beck's study, as the severity of depression from mild to severe increases, there was a serious increase in body image disorder from 33% to 66% (32). This can be explained by the fact that the deterioration in body image triggers negative moods such as depression and anxiety in youngsters, and individuals with

mood disorders are not able to evaluate their emotions and also situations properly, nor can they accurately assess their own body weight.

This study was based on the self-reports of students studying at only one university, the time period of the study, available resources on the subject, and data provided by data collection tools. And also this study was conducted on only one university campus. Multi-central large sample studies would be beneficial for establishing a stronger relationship between the main tools used for young adults.

Conclusion

There was a strong relationship between perceived body weight and depression and 1 of every 4 students misjudged their body weight. Body perception of participants who were 'underweight' according to BMI was in the perceptual direction of obesity and who were 'overweight' according to BMI was in the perceptual direction of thinness. Students who were 'normal' according to BMI have a healthier body image.

As two general recommendations, it is recommended to integrate mental health services into primary health care services and to carry out similar studies with different samples in different time periods.

Journalism Ethics considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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Conflict of Interest

The author declares that there is no conflict of interests.

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