The relationship between personality traits and BMI categories

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ABSTRACT

OBJECTIVE: To compare personality traits between average weight, overweight and obese people using Eysenck Personality Questionnaire Revised-Abbreviated Form (EPQR-A). Study design: Cross-sectional, descriptive study. Place and duration of study: S. B. U Kartal Dr. Lutfi Kirdar Training and Research Hospital Family Medicine Obesity Policlinic and Family Medicine Outpatient Clinics, from November 2018 to January 2019.

METHODS: Participants aged between 18 and 65 years (279 female and 150 male) were layered according to Turkish Endocrinology and Metabolism Society (TEMD) Body Mass Index (BMI) categories to compare personality traits between normal weight, overweight and obese people. Each layer was compared to each other in this study. A questionnaire, including socio-demographic form, and EPQR-A Form were applied to the participants.

RESULTS: Patients aged between 18 and 65 years (279 female and 150 male) were evaluated according to BMI categories. There was a significant difference in psychoticism score averages by BMI categories (p<0.001). The mean of psychoticism scores showed a V-shaped distribution according to the BMI categories. There were no significant differences between the average scores of neuroticism and extraversion according to BMI categories (p=0.094; p=0.157, respectively).

CONCLUSION: There was a significant difference in psychoticism score averages by BMI categories. The mean of psychoticism scores showed a V-shaped distribution according to the BMI categories.

Keywords: BMI categories; Eysenck Personality Questionnaire; impulsivity; obesity; personality traits.

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Obesity is a complex and critical public health issue. It is one of the most important causes of preventable deaths. Overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health. Body mass index (BMI) is defined as a person's weight in kilograms divided by the square of his height in meters (kg/m²).[1] According to Turkey Endocrinology and Metabolism Association (TEMD) Guideline, normal-weight BMI 18–24.99, overweight BMI 25–29.99, class I obesity BMI 30–34.99, class II obesity BMI 35–39,99, and morbid obesity BMI ≥40.[2] According to WHO, obesity is one of the most significant problems of public health with its increasing prevalence worldwide.[1] The prevalence of obesity in all ages is increasing in our country and has exceeded the critical rate of 30% in adults.[2] According to the WHO 2016 report, Turkey is the most obese nation in Europe with 29.5% obesity prevalence.[1] In the TURDEP II Study (2010), the prevalence of obesity was found to be 44% in females, 27% in males and 35% in the general population.[3]

In epidemiological studies, it has been found that many factors, such as age, gender, marital status, education level, genetic background, nutrition, lack of physical activity, smoking and alcohol use, may cause obesity. However, there are studies showing that psychological processes, such as personality traits, are also associated with obesity.[4–7]

Personality is the whole of the traits that separates the individual from others. Since the past, certain definitions have been made and theories have been developed to understand human personality and personality traits. According to these theories, tools for assessing personality traits have been developed.[8, 9]

In Jung's personality theory, he introduced definitions of introvert and extrovert individuals to personality. These features have been modified by Eysenck and many other theorists.[8, 10] In the beginning, Eysenck developed scales to measure the dimensions of extraversion and neuroticism. Eysenck later developed his theory, saying that personality consists of three sub-dimensions: extraversion, neuroticism, and psychoticism. Eysenck stated that these distinctive personality traits are independent dimensions.[11–13]

These distinctive personality traits were related to specific feelings and behaviors. It was found that neuroticism was related to low self-esteem, fear, anxiety, depression and a tendency towards emotional and irrational behavior. Extraversion was related to having many friends, a love of socializing and going to parties, impulsivity, uncontrolled emotions and sometimes unreliable personality traits. Finally, psychoticism was related to hostility, distant and antisocial behaviors, insensitivity towards others.[12] Eysenck conducted studies to investigate the relationship between impulsivity and these three factors and found that impulsivity was more related to psychoticism.[14, 15] The present study aims to investigate the personality traits between normal weight, overweight and obese people using EPQR-A Form.

MATERIALS AND METHODS

This cross-sectional, descriptive study was performed between November 2018 and January 2019 at the Kartal Dr. Lutfi Kirdar Training and Research Hospital Family Medicine Obesity Policlinic and Family Medicine Outpatient Clinics. Participants aged between 18 and 65 years (279 female and 150 male) were layered according to TEMD BMI categories to compare personality traits between normal weight, overweight and obese people. Each layer was compared to each other in this study. According to TEMD Guideline, normal weight BMI 18–24.99, overweight BMI 25–29.99, class I obesity BMI 30–34.99, class II obesity BMI 35–39.99, morbid obesity BMI ≥40. [2] According to the study exclusion criteria following BMI<18, pregnant, schizophrenia and other psychotic disorders, suicidal patients, dementia and cognitive disorders of any kind, and Parkinson's like neurological diseases identified with specific personality traits and the presence of a severe disease that could interfere with the completion of the interview were all excluded from this study. After obtaining informed consent from each subject in this study, a socio-demographic form and a validated EPQR-A Form was used in the study. According to the prevalence of adult BMI distribution of the TURDEP II Study, the number of people in each layer was determined. In the TURDEP II Study, the prevalence of obesity over 20 years of age was 44% female and 27% male. In addition, the rate of admission to obesity policlinics was 70% female and 30% male.[3, 5] The male and female ratio was determined according to these data. This study was approved by local ethics committee (31/10/2018 - 2018/514/140/17).

Eysenck Personality Questionnaire Revised-Abbreviated Form (EPQR-A)

Francis et al. (1992) developed EPQR-A by reviewing the Eysenck Personality Questionnaire and the abbreviated form of the same questionnaire.[16] The EPQR-A Form is used to assess the personality traits of a person. It contains neuroticism, extraversion, psychoticism scales and also to prevent bias during the administration of the questionnaire, it contains the lie scale. It consists of 24 questions, which are scored as yes (1)/no (0) with possible scores ranging from 0 to 6. Each scale represents by six questions. The reliability and validity study of the Turkish form was performed by Karancı et al. in 2007.[17]

Statistical Analyses

The SPSS 17.0 for Windows software was used for the statistical analysis. Descriptive statistics, such as frequency, percentage, frequency, mean, median, minimum, maximum value and standard deviation, were used in this study. Kolmogorov Smirnov test was used to analyze whether the data were normally distributed and Spearman correlation analysis, Kruskal-Wallis tests were used for variables that did not show normal distribution. The analysis of categorical variables was performed using Chi-Square test. Statistical alpha significance level was considered as $p<0.05$.
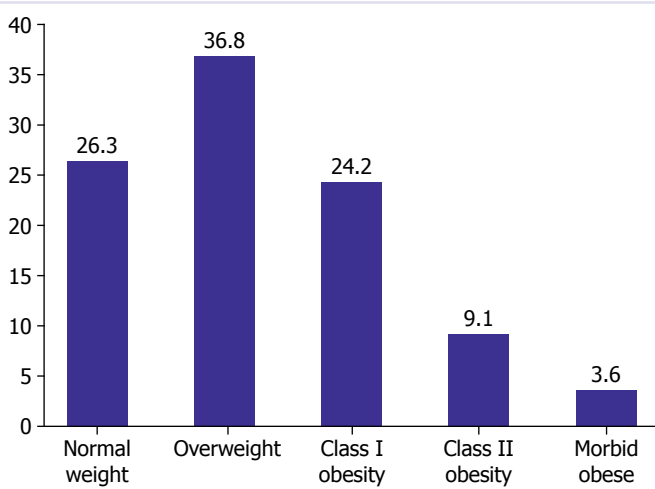
Figure 1. The distribution percentage of participants by BMI categories.

RESULTS

A total of 429 people, 279 women (65%) and 150 men (35%) were included in this study. The mean age of the participants was 38.4±12.1 years. The majority of the participants were married (68,5%; n=294) and employed (62.9%; n=270). A weak positive correlation was found between age and BMI values (r=0.473; p<0.001). When the age of the participants was grouped over the age of 35 years, the mean BMI of the patients aged 35 years and younger was 25.9±5.5 kg/m² and in the group, over 35 years, it was 31.2±5.8 kg/m². The distribution percentage of participants according to BMI is given in Figure 1. The socio-demographic characteristics of the participants according to BMI categories are given in Table 1.

Tobacco and alcohol consumption rates of the participants were 33.8% (n=145) and 12.6% (n=54), re-

Table 1. The socio-demographic characteristics of the participants according to BMI categories

	Body mass index categories					Total	p
	18–24.9 (%)	25–29.9 (%)	30–34.9 (%)	35–39.9 (%)	≥40 (%)	n (%)	
Gender (n=429)							
Female	70 (16.3)	99 (23.1)	72(16.8)	27 (6.3)	11 (2.6)	279 (65)	0.658
Male	43 (10)	59 (13.8)	32 (7.5)	12 (2.8)	4 (0.9)	150 (35)	
Marital status (n=429)							
Married	43 (10)	117 (27.3)	90 (21)	32 (7.5)	12 (2.8)	294 (68.5)	<0.001
Other	70 (16.3)	41 (9.6)	14 (3.3)	7 (1.6)	3 (0.7)	135 (31.5)	
Working condition (n=429)							
Unem-ployed	7 (1.6)	25 (5.8)	40 (9.3)	17 (4)	10 (2.3)	99 (23.1)	
Employed	89 (20.7)	118 (27.5)	48 (11.2)	13 (3)	2 (0.5)	270 (62.9)	<0.001
Other	17 (4)	15 (3.5)	16 (3.7)	9 (2.1)	3 (0.7)	60 (14)	
Education-al status (n=429)							
Primary education	6 (1.4)	50 (11.7)	55 (12.8)	21 (4.9)	9 (2.1)	141 (32.9)	
High school	16 (3.7)	21 (4.9)	20 (4.7)	12(2.8)	4 (0.9)	73 (17)	<0.001
University and over	91 (21.2)	87 (20.3)	29 (6.8)	6 (1.4)	2 (0.5)	215 (50.1)	
Economic income (n=429)							
≤Minimum wage	26 (6.1)	54 (12.6)	54 (12.6)	27 (6.3)	12 (2.8)	173 (40.3)	<0.001
>Minimum wage	87 (20.3)	104 (24.2)	50 (11.7)	12 (2.8)	3 (0.7)	256 (59.7)	
With whom lives (n=429)							
Wife and children	42 (9.8)	117 (27.3)	88 (20.5)	33 (7.7)	11 (2.6)	291 (67.8)	
Family	32 (7.5)	18 (4.2)	6 (1.4)	4 (0.9)	2 (0.5)	62 (14.5)	<0.001
Other	39 (9.1)	23 (5.4)	10 (2.3)	2 (0.5)	2 (0.5)	76 (17.7)	
Number of children (n=429)							
0	87 (20.3)	52 (12.1)	16 (3.7)	8 (1.9)	4 (0.9)	167 (38.9)	
1	14 (3.3)	25 (5.8)	16 (3.7)	5 (1.2)	2 (0.5)	62 (14.5)	
2	6 (1.4)	53 (12.4)	37 (8.6)	14 (3.3)	3 (0.7)	113 (26.3)	<0.001
3+	6 (1.4)	28 (6.5)	35 (8.2)	12 (2.8)	6 (1.4)	87 (20.3)	

TABLE 2. Personality traits and demographic features of the participants

	Neuroticism	p	Extraversion	p	Psychoticism	p
Gender						
Female	2.58±1.85	0.310	4.27±1.80	0.490	1.05±1.05	0.923
Male	2.39±1.83		4.15±1.63		1.04±1.02	
Marital Sta-tus						
Married	2.39±1.77	0.052	4.31±1.69	0.162	0.90±0.96	**0.000**
Other	2.78±1.98		4.05±1.84		1.36±1.12	
Occupation						
Unemployed	2.69±1.96		4.13±1.88		0.83±0.88	
Employed	2.48±1.82	0.559	4.25±1.69	0.929	1.13±1.09	0.088
Other	2.37±1.77		4.27±1.76		1.03±0.99	
Education						
Primary education	2.57±1.84		4.28±1.70		0.87±0.90	
High school	2.67±1.80	0.484	4.22±1.83	0.900	0.96±1.0	**0.022**
University and over	2.42±1.87		4.20±1.74		1.19±1.10	
Income						
≤Minimum wage	2.58±1.89	0.500	4.23±1.82	0.960	0.97±0.99	0.184
>Minimum wage	2.46±1.82		4.22±1.69		1.10±1.06	
With whom lives						
Wife and chil-dren	2.37±1.77		4.33±1.68		0.89±0.96	
Family	3.11±1.83	0.015	4.05±1.85	0.274	1.32±1.11	**0.000**
Other	2.55±2.05		3.99±1.89		1.43±1.13	
Number of children						
0	2.61±1.92		4.03±1.80		1.32±1.10	
1	2.77±1.90		4.50±1.60		1.02±1.04	
2	2.47±1.86	0.265	4.38±1.77	0.152	0.94±0.99	**0.000**
3+	2.18±1.60		4.21±1.67		0.69±0.82	

spectively. The mean tobacco and alcohol duration of the participants was 5.0±9.1 years and 1.5±4.8 years, respectively. When the Class III obese group and the morbidly obese group were combined, there was a significant difference between the BMI categories concerning alcohol consumption (p=0.006). There was no significant difference concerning tobacco consumption between BMI categories (p=0.270). There was a significant difference in terms of chronic disease between BMI categories (p<0.001). The most common chronic disease was DM (18.4%). The majority of the participants made up 62.7% (n=269) of the main meal 3 and above. The percentage of the participants who had at least one professional diet support was 46.2% (n=198). There was a significant difference in terms of professional diet support between BMI categories (p<0.001). There was no significant difference regarding exercise history between BMI categories (p=0.127) (Table 1).

Mean scores of neuroticism, extraversion and Psychoticism and demographic features of participants are given in Table 2. It was seen that psychoticism was associated with most of the demographic features but neuroscistism and extraversion.

There were no significant differences between the mean scores of neuroticism and extraversion, according to BMI categories (p=0.094; p=0.157, respectively). On the other hand, there were significant differences between the average scores of psychoticism, according to BMI categories (p<0.001) (Table 3). The mean of psychoticism scores showed a V-shaped distribution according to the BMI categories (Fig. 2).

DISCUSSION

Obesity is an important public health problem that has many factors in its infrastructure and is a risk factor for

TABLE 3. Average neuroticism, extraversion and psychoticism scores in different BMI categories			
	Neuroticism score (Mean±SD)*	Extraversion score (Mean±SD)**	Psychoticism score (Mean±SD)***
Normal weight	2.4±1.8	4.1±1.8	1.4±1.1
Overweight	2.5±1.8	4.2±1.7	1.0±1.0
Class I obesity	2.5±1.9	4.6±1.6	0.7±0.8
Class II obesity	2.3±1.7	3.8±2.1	1.0±0.9
Morbid obese	3.8±1.5	4.0±1.6	1.5±1.1

BMI: Body mass index; SD: Standard deviation; *: p=0.094; **: p=0.157; ***: p=<0.001.

FIGURE 2. Distribution of the psychoticism score averages according to BMI categories.

many diseases. Obesity continues to increase rapidly despite the social pressure on weight loss, increased treatment possibilities and access to treatment. This situation has brought to mind that the underlying psychological processes in obesity may also be effective and many studies have been conducted to investigate the personality traits, body perceptions, eating disorders of obese individuals. In this context, some researchers concluded that the personality characteristics of obese people were not different from the general population.[18] However, some researchers have also found high scores in oral dependent characteristics in obese individuals.[19] According to another study on women, it was found that women with obesity tended to participate less in the social environment compared to non-obese women and they were more prone to anxiety.[20] In addition, there were studies showing that people with impulsivity were at risk for the development of obesity and people who were obese have difficulty in maintaining the treatment process due to their tendency towards calorie and tasty foods.[4, 6] There was also a study showing that personality traits associated with binge eating disorder symptoms were high novelty seeking, high harm avoidance and low self-management.[21] In another study, food addiction, psychopathology and personality traits were evaluated in obesity patients and control loss and excessive desire, which are the main characteristics of addiction, were shown in obesity patients.[5]

The discriminative personality characteristics defined by Eysenck were reportedly related to specific feelings and behaviors. Eysenck conducted studies to investigate the relationship between impulsivity and these three fac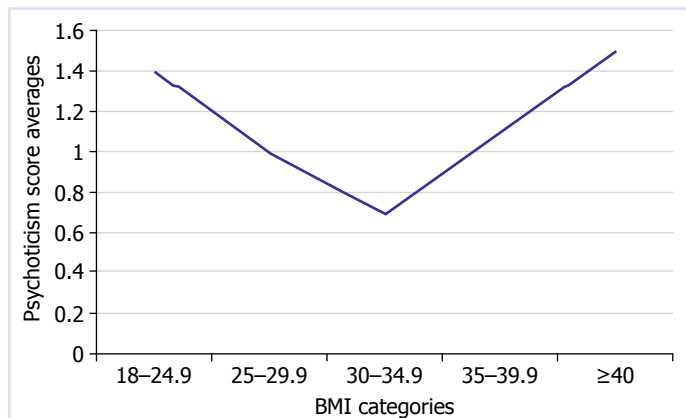tors and found that impulsivity was more related to psychoticism.[14, 15] In our study, there were significant differences between the average scores of psychoticism according to BMI categories (p<0.001). The mean of psychoticism scores showed a V-shaped distribution according to the BMI categories.

In this context, it was an important finding of our study that the average scores of psychoticism increased from class I obese group to morbid obese group. We think that boosting impulsivity and psychoticism with psychotherapy in obese individuals will increase success in the treatment of obesity. The lack of control group, the inability of standardization of social factors that also affect the use of health services were important limitations of this study. To investigate this situation more clearly, it is necessary to carry out prospective studies.

In conclusion, there was a significant difference in psychoticism score averages by BMI categories. The mean of psychoticism scores showed a V-shaped distribution according to the BMI categories. No significant correlation was found between BMI values and neuroticism and extraversion scores between the groups.

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