

# The Relationship Between Personality Traits and Defense Styles with Body Mass Index in High School Female Students

ZAHRA ALIPOUR<sup>1\*</sup>, FATEMEH GOLSHANI<sup>2</sup> and ROYA KOUCHAKENTEZAR<sup>2</sup>

<sup>1</sup>Department of Educational Psychology, Central Tehran Branch, Islamic Azad University, Tehran, Iran.

<sup>2</sup>Associate Professor of Psychology (PhD), Central Tehran Branch, Islamic Azad University, Tehran, Iran.

<http://dx.doi.org/10.13005/bpj/995>

(Received: May 15, 2016; accepted: June 30, 2016)

## ABSTRACT

This study aimed to examine the relationship between personality traits and defense styles with Body Mass Index of high school female students. For this purpose, 220 people were selected as a sample of high school female students using multistage random sampling method. The students were examined by short form questionnaire of personality traits (NEO) and defense styles questionnaire (DSQ) as well as calculation of Body Mass Index (height and weight). Multivariate regression analysis was used for hypotheses test. The findings suggest that personality traits are not able to predict body mass index, but neurotic psychological defense styles have a significant correlation with body mass index. This means that increasing the scores of neurotic psychological defense style increases body mass index, while defense mechanisms including altruism, displacement, humor and undoing were able to predict body mass index.

**Key words:** Personality traits, defense styles, body mass index.

## INTRODUCTION

Obesity means excessive amount of fat in the body. There are different criteria to measure and classify obesity. The most common criterion for measuring obesity is body mass index obtained when a person's weight in kilograms is divided by the square of height in meters. According to the World Health Organization's report, obesity refers to a body mass index higher than 30 and considered as one of the 10 most common health problems in the world. The prevalence of obesity is on the rise in all age groups and in most countries. According to the statistics of different countries, obesity is increasing among the youth and teens. In fact, teenage involve the individual in numerous problems so that this period of life is known as the period of psychological disorganization. During this period, young people find a specific perception of their body, and then environmental and

psychological factors will be created due to the lack of diversity, proportionality, and balance between diets - genetic problems. One of the psychological factors discussed in field of obesity is alexithymia. Alexithymia is a construct in which person has problem with describing, identifying and distinguishing the emotions for others (Assar *et al.*, 2012; Davodi & Afshari, 2011).

And this alexithymia encounters with stressful events and factors, including psychopathology factors, which is considered as in view psychoanalysis as is the style of defense (Davodi & Afshari, 2011; Mazaheri *et al.*, 2012; Mazaheri *et al.*, 2010). People use different defense styles to be able to adjust, distort or remove stressful thoughts, feelings and perceptions. Vaillant (1977) believes that people usually use three defense strategies to overcome stressful conditions; and the first strategy is seeking out social support. The

second strategy is conscious cognitive strategies used to overcome stress publicly. And the third strategy is unconscious and involuntary strategies. Freud considers the style of defense as unconscious strategies of ego to control instincts and impulses, on the one hand they could be compromise and on the other hand, can be pathogenic and non-compromise. On the other hand, identifying defense styles can be a way to recognize the individual differences of people and their personality structure (Dadsetan, 2010).

Introducing defense styles in the literature offers several different categorizations for them which is considered as a range from mature to immature. In this respect, they are also divided into three groups: mature, immature and neurotic. A combination of neurotic and immature defense mechanisms may lead to disorders in eating and body mass index. In fact, overeating is used as a biological moderating mechanism to regulate, create and avoid negative impacts or deal with uncomfortable events is (Behzadi Pour, 2011).

According to the studies, immature defense styles were considered as risk factors in a way that primary defense mechanisms such as denial, repression and projection are prevalent in obese people, and they are likely to use these mechanisms to protect them against negative emotions and aggressive drives that tend to prevent and project them to an external object as well as its replacement by overeating. On the other side, quantitative studies also diagnosed certain personality characteristics in obese people. Some personality characteristics and eating behaviors show that the probability that neuroticism and extraversion can be related to emotional overeating. Personality traits are the possible factors that can be important to predict quantitative function of clinical phenomenology, diagnosis and treatment. According to Costa and McCrae's five factors model, personality traits are discussed in the form of subscales of neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness (Schultz & Schultz, 2016).

Research conducted by Miller *et al.* (2008), based on the personality characteristics with the subscales of neuroticism and obesity and eating

disorders, indicated that emotional overeating leads to neuroticism and extraversion and also low scores in conscientiousness are associated with emotional overeating. Other research results by Safaralizadeh and Partovazam (2010) showed that obesity and overweight can compromise the person's mental health and enhance their chances of depression. Personality traits such as neuroticism, lead to impulsive behavior, depression and anxiety. According to what was said in this research, we are intended to answer the question which of the defense styles and personality traits predict body mass index?

### Research Methodology

To review research questions in the form of a descriptive correlational study, 220 people were selected as a sample of 8541 female students in high schools using multistage random sampling method. And in order to collect data, short-form of NEO personality traits inventory, DSQ defense style questionnaire and calculation of body mass index (height and weight) were used.

### Research Tools

NEO PI-R inventory is a personality test made on the basis of factor analysis. It is one of the newest tools in the field of personality introduced by McCrae and Gustav in 1985 under the name NEO Personality Inventory. It has also another form called NEO-FFI which is a 60-item questionnaire used to evaluate Big Five personality traits. In the 240-item form, each factor has six levels at subscales. While in the short form, each factor is measured by 12 questions. Big Five personality traits are neuroticism, extroversion, flexibility (agreeableness), openness, conscientiousness (responsibility) (Roshan Chesly *et al.*, 2006). Defense Style Questionnaire was examined by Andrews *et al.* (1993), the questionnaire evaluated 20 types of defense mechanisms at three levels of mature, neurotic and immature.

1. Mature defense style (developed): sublimation, humor, anticipation and suppression
2. Immature defense style: rationalization, projection, denial, omnipotence, making unworthy, transition to action, autistic fantasy, lamination, somatization, passive aggression, displacement, isolation.

3. Neurotic defense style: false altruism, reaction formation (inverse reaction), idealization (rationalization), undoing (Besharat, 2009). sensitivity of 100 grams. And height is measured using a non-dilation-meter strip with an accuracy of 0.5 cm.

BMI is a person's weight in kilograms is divided by the square of height in meters. Weights are measured by Azaram Full Digital Weight with a

**Findings**

The results of Table 1 indicate that there is no significant correlation between personality traits and body mass index at the level of 0.05. So these

**Table 1: The correlation coefficients for the relationship between personality and body mass index**

Variables	BMI		
	Number	Correlation coefficient	Significance
Neurosis	220	0.006	0.934
Extraversion	220	0.085	0.207
Flexibility	220	0.012-	0.858
Openness	220	0.034	0.617
Conscientiousness	220	0-.016	0.818

**Table 2: The correlation coefficients for the relationship between defense styles and body mass index**

Variables	BMI		
	Number	Correlation coefficient	Significance
Immature	220	0.059	0.382
Mature	220	0.084	0.216
Neurotic	220	0.224**	0.001

**Table 3: The results of significance of the regression model**

Variables	Source of changes	Sum of squares	Degree of freedom	R	R <sup>2</sup>	F	Significance level
Defense styles	Regression	183.129	3	0.229	5.3	3.99	0.008
	Remaining	3296.831	216				
	Total	3479.961	219				

**Table 4: Regression coefficients and their significance test**

Variables	b	Standard deviation	Beta	t-statistic	Significance level
Fixed	0.001	9.004		1.925	17.330
Immature	0.704	-0.380	-0.027	0.312	-0.119
Mature	0.457	0.745	0.051	0.224	0.167
Neurotic	0.002	3.169	0.223	0.232	0.736

personality traits are not able to predict body mass index. At first, the correlation coefficients between each of the characteristics and the body mass index score in the subjects were calculated. But according to the results obtained in this study, there was no significant correlation between personality traits and body mass index. So these personality traits were not able to predict body mass index.

The results in Table 2 indicate that there is a significant correlation between neurotic defense styles and body mass index at the level of 0.01. At first, the correlation coefficients between each of

defense styles and the body mass index score in the subjects were calculated. There was a significant correlation between neurotic defense styles and body mass index. It means that BMI increases with increasing the neurotic defense style score. Multivariate regression analysis method has been used to study BMI based on defense styles.

Since  $R^2$  is the common variance percentage of defense styles in predicting body mass index, the results of Table 3 indicate that defense styles predict 5.3% of the body mass index variance. Given that F calculated is significant at

**Table 5: The correlation coefficients for the relationship between defense mechanisms and body mass index**

Mechanisms	BMI		
	Number	Correlation coefficient	Significance
Rationalization	220	0.021	0.755
Projection	220	-0.015	0.831
Denial	220	0-.093	0.168
Omnipotence	220	-0.023	0.733
Making unworthy	220	-0. 009	0.898
Transition to operation	220	0.022	0.741
Somatization	220	0. 050	0.462
Fantasy	220	0.092	0.176
Lamination	220	0.039	0.561
Aggression	220	0.089	0.189
Displacement	220	0. 153*	0.023
Isolation	220	0.001	0.991
Suppression	220	0. 089	0.188
Sublimation	220	0.043	0.529
Humor	220	0. 173**	0.010
Anticipation	220	0.119	0.079
Altruism	220	0. 140*	0.037
Reaction formation	220	0.083	0.219
Rationalization	220	0.078	0.251
undoing	220	0. 243**	0.001

**Table 6: The results of significance of the regression model**

Variables	Source of changes	Sum of squares	Degree of freedom	R	$R^2$	F	Significance level
Mechanisms	Regression	580.510	20	0.409	16.7	1.989	0.009
	Remaining	2889.830	198				
	Total	3470.340	218				

the level of 0.05, the linear regression model is significant and thus defense styles had significant linear correlation with body mass index.

The results from table 4 shows that only neurotic defense styles are able to predict BMI and t-test is significant for the significance of regression coefficients at lower than 0.05. Regression coefficient of neurotic defense style with MBI index is positive.

Regression equation for predicting BMI in terms of predictor variables of defense styles based on non-standard regression coefficient is:  $BMI=17.33+0.223$  (Neurotic defense style)

The results in Table 5 shows that there is a significant positive correlation between the defense mechanism of displacement, humor, altruism and cancellation with body mass index score at less than 0.05. The highest correlation was between the undoing and body mass index, and the lowest correlation between displacement and body mass index. Therefore, regression coefficients of defense

mechanisms obtained by Body Mass Index were positive.

Since  $R^2$  is the common variance percentage of defense mechanisms in predicting body mass index, the results indicate that defense mechanisms predict 16.7% of the body mass index variance. Given that F calculated is significant at the level of 0.05, the linear regression model is significant and thus defense mechanisms had significant linear correlation with body mass index.

Results from Table 7 shows that the defense mechanisms of displacement, humor and undoing are able to predict body mass index, and t-test for significance of regression coefficients is significant at less than 0.05. Given that b is the regression coefficient from raw scores and so influenced by the predictors, using Beta which is the regression coefficient of standardized scores is recommended. Comparing standard regression coefficients indicates that the share of defense mechanism of humor (0.252 = Beta) and undoing mechanism (0.164 = Beta) to predict body mass

**Table 7: Regression coefficient and their significance test**

Variable	b	Standard deviation	Beta	t-statistic	Significance
Fixed	17.457	2.239		7.797	0.001
Rationalization	-0.059	0.108	-0.041	-0.540	0.590
Projection	-0.078	0.089	-0.062	-0.867	0.387
Denial	0.129	0.078	0.127	1.657	0.099
Omnipotence	0.047	0.093	0.041	0.503	0.616
Making unworthy	-0.094	0.088	-0.080	-1.070	0.286
Transition to operation	-0.018	0.085	-0.018	-2.13	0.831
Somatization	-0.128	0.074	-0.137	-1.743	0.083
Fantasy	0.008	0.073	0.010	0.116	0.908
Lamination	0.023	0.082	0.022	0.274	0.784
Aggression	0.102	0.087	0.097	1.175	0.242
Displacement	0.139	0.088	0.137	2.057	0.037
Isolation	0.030	0.070	0.033	0.429	0.668
Suppression	-0.084	0.070	-0.089	-1.200	0.231
Sublimation	-0.045	0.071	-0.046	-0.632	0.528
Humor	0.253	0.079	0.252	3.201	0.002
Anticipation	0.135	0.106	0.098	1.276	0.203
Altruism	0.032	0.094	0.027	0.341	0.734
Reaction formation	0.026	0.071	0.027	0.367	0.714
Rationalization	0.037	0.068	0.039	0.536	0.592
undoing	0.187	0.085	0.164	2.185	0.030

index is greater than defense mechanisms of displacement ( $0.137 = \text{Beta}$ ). All of these regression coefficients are positive.

Regression equation for predicting BMI in terms of predictor variables of defense styles based on standard Beta scores is: (displacement)  $Z 0.137 +$  (undoing)  $0.164 +$  (humor)  $Z 0.252 =$  body mass index

### DISCUSSION

The results of this study showed that none of personality traits are correlated with body mass index. The result is consistent with the results of the study by (Fabritcio Wooden quoted by Fereydouni, 2012) about personality traits and obesity. On this basis, there was no relationship between any particular personality trait or personality style with obesity. On the other hand, they concluded that people with a high body mass index, i.e. obese people with emotional overeating, have a low self-esteem based on a mutual relationship (the higher is the emotional overeating, the lower is the self-esteem and vice versa). Other research results (Behzadi Pour, 2012) show that obese people are different from normal people in extroversion, acceptability, conscientiousness and openness. So according the findings of the research conducted and this study, it could be concluded that the pros and cons can be due to the sample size and population of this study. Given that few of the students had a body mass index greater than 30, it can be said there is no relationship between personality traits and body mass index.

Another result obtained in the present study shows that there is a relationship between defense styles and BMI. The results showed that there is only a significant correlation between neurotic defense style scores base and BMI, in which BMI increases with increasing neurotic defense style scores. These results are consistent with the findings of Stein *et al.* in a group of girls,

that a combination of neurotic and immature defense styles can lead to disorders in eating and body mass index. A research on the relationship between personality traits and defense styles with eating disorder symptoms in girls and boys carried out by Kachuei and the relationship between personality traits and defense mechanisms in obese people conducted by Behzadi Pour concluded that people with symptoms of eating disorder and body mass index use neurotic and immature defense styles. Thus, it can be said that the regression coefficient of neurotic defense style with body mass index is positive. Given that people with high BMI use neurotic defense style to reduce internal stress and transfer it outside against stressful conditions, it can be said that defense styles are significantly related to BMI.

Also according to other results in this study, there is a relationship between defense mechanisms and BMI. Defense mechanisms predict body mass index. Based on the results obtained, there is a significant relationship between defense mechanisms of undoing, displacement, humor and false altruism with body mass index. According to research conducted by Kachuei, Behzad Pour, Stenberg, and Wallenberg, there is a significant relationship between defense mechanisms (displacement - rationalization- false altruism and lamination) with body mass index and symptoms of eating disorders. Presumably, obese people tend to use humor, undoing, displacement and altruism to protect themselves against negative emotions and aggressive drives by assigning them to an external object and redirect them in order to reduce stress and anxiety. In general, personality traits are not significantly correlated with body mass index (according to the population and sample, and also based on descriptive data, few of students had a body mass index higher than 30), but neurotic defense styles and defense mechanisms (altruism, humor, undoing and displacement) are correlated with body mass index.

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