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Research Article

Identification of Psychological Risk and Protective Factors of Obesity in Women

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Abstract

Objective: Obesity is a complex, multifactorial, chronic, and progressive disease that has become a crucial public health problem worldwide. Therefore, it seems necessary to identify risk and protective factors to prevent obesity and treat obesity. This study aims to identify the risk and protective factors of obesity in women.

Method: The study was descriptive-correlational. The research sample consisted of 429 overweight and obese women, selected through voluntary sampling. To collect data, a physical activity questionnaire, core beliefs of eating questionnaire, self-criticism questionnaire, shame and guilt scale, self-esteem scale, body image concern questionnaire, stress-anxiety-depression questionnaire, and weight self-efficacy questionnaire were used. The obtained data were analyzed using stepwise regression using SPSS 24.

Results: The findings showed that among obesity risk factors (core beliefs of eating, self-criticism, shame and guilt, concern about body image, stress-anxiety-depression), the core beliefs of eating, stress, and depression can predict obesity. Also, the research results showed that among obesity protective factors (weight self-efficacy, self-esteem, and physical activity), weight self-efficacy can predict obesity improvement more than other variables.

Conclusion: Based on the results of the present research, we can say that the variables of core beliefs about eating, stress, and depression as risk factors and the variable of self-efficacy as a protective factor can predict body mass index.

Keywords: Risk factors, Protective factors, Psychological factors, Obesity, Women.

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Extended Abstract

Background and Objectives

Today, obesity is an important issue all over the world, as well as in the Middle East. Iran has 61.6 percent of people with obesity among the seven Middle Eastern countries, according to the report of the WHO in 2016, weight and 25.8% obese. Therefore, over the last decade, obesity and the identification of risk factors and protective factors (environmental, biological, and psychological) have been significant topics in clinical research, with a strong emphasis on their role in effective obesity treatment.

What has turned obesity into a global problem today is the presence of risk factors that vary in people's lifestyles from childhood to adulthood. In contrast to risk factors, researchers are looking for factors that can play an effective role in preventing and reducing disease and protecting people's health. The most important indicators that can be effective as a protective factor in the regulation of negative emotions and eating behavior.

In general, it can be acknowledged that what is evident in the results of the conducted research is that in identifying the risk and protective factors of obesity, researchers have mainly focused on the correlation of various biological and environmental factors with body mass index. Therefore, conducting this research is important in that by using BMI as a criterion, we intend to investigate the mechanism of the effect of psychological factors on body mass index and determine which of the common risk and protective factors are involved. It can be related to obesity. Which variables can predict the variance of body mass index as risk and protective factors?

Materials and Methods

This study was descriptive-correlational. The research sample consisted of 429 overweight and obese women aged between 20 and 40 years old who used one of the virtual platforms (Telegram and WhatsApp) in 1401 and were voluntarily selected and responded online to the research tool that was created by the porsline website and its link was sent to the obesity treatment groups in Qazvin on WhatsApp and Telegram.

Research data were obtained using BMI tools, based on which people with a BMI>30 are obese, BMI 25-30: overweight, BMI 20-25: normal weight, and BMI<20 are suffering from anorexia nervosa. Beck Physical Activity Questionnaire (Beck, 1982), Eating Disorder Core Beliefs Questionnaire (Cooper et al., 1997), Self-Criticism Questionnaire (Gilbert et al., 2004), Shame and Guilt Scale (Cohen et al., 2011), Self-Esteem Scale (Rosenberg, 1965), Body Image Concern Questionnaire (Littleton et al., 2005), Stress-Anxiety-Depression Questionnaire (Lavibond and Lavibond, 1995), and Weight Self-Efficacy Questionnaire (Clark et al., 1991) were analyzed using stepwise regression using SPSS 24 software.

Results

In the present study, 429 women with a body mass index above 25, with an average age of 31.72 and a standard deviation of 6.31, participated. Before implementing the regression statistical method, its presuppositions were investigated. The results showed that the assumptions are valid.

The results showed that among the predictor variables, risk components, eating beliefs, and stress positively and depression negatively predict body mass index. These variables explain a total of 7% of body mass index. ($P<0.01$).

Also, among the variables predicting protective components, self-efficacy was able to negatively predict body mass index. ($P<0.01$).

Discussion and Conclusion

The present study was conducted with the aim of identifying the risk and protective factors of obesity in women. The obtained results indicated that the negative belief of eating as a risk factor is more than other variables, and in line with them, has the predictive power of body mass index. The obtained result can be explained based on many consistent studies and Beck's theory of negative beliefs (1979) in such a way that negative beliefs about health and habitual thinking patterns are very general and are pervasive and occur as a result of a lack of personal control and failure to achieve the goal in eating.

Another finding of the present study indicated that stress can predict an increase in body mass index. This finding is in line with the results of research. In the explanation, it seems that physical and psychological stress, such as illness, marital

conflict, failure, social exclusion, etc., cause disturbances in physiological, cognitive, and behavioral dimensions and weaken the self-regulation strategies that are necessary to control eating.

In addition, another finding of the research showed that depression can predict a decrease in body mass index. This finding is in line with the results of the research. In explaining this finding, we can point to events that mainly include the content of loss and failure. Depressed people feel futility, emptiness, and despair; they criticize themselves with useless and irrational labels. These wrong and pessimistic beliefs about oneself lead to wrong decisions and disrupt physiological symptoms such as sleep, appetite.

Another finding of the present study indicated that self-efficacy as a protective factor can predict the reduction of body mass index. The obtained findings can be explained based on consistent studies and the self-efficacy theory of Albert Bandura (1977). In other words, people with a high sense of efficacy firmly believe that they can make effective decisions with their analytical thinking when faced with stressful situations. Self-efficacy is related to positive emotions, effective problem-solving, life satisfaction, motivation, and self-esteem. Therefore, higher positive affect may lead to feeling more control over the environment and higher self-efficacy in weight management and a sense of worth.

According to the findings of the present study and the review of the results of similar studies, it can be concluded that Factors such as negative beliefs, stress, depression, and self-efficacy be exposed to can affect the occurrence or protection of obesity. These factors may be different in different societies according to social, economic, cultural, and climatic factors.

Voluntary sampling, not considering the social, economic, and cultural situation, virtual implementation can be considered a limitation of the current research. The results of this study and similar studies can be used in obesity treatment centers by using new methods of psychological treatments along with other treatments in order to improve obesity and increase awareness of eating behavior.

Introduction

Today, obesity is an important issue all over the world that has a significant health and social burden, and due to the medical and psychological conditions associated with it, it is subject to bias and relentless stigma, and an increase in physical, mental, and death complications (Ward et al., 2021). Reports indicate that obesity is spreading all over the world as well as in the Middle East countries (Nikkar Esfahani et al., 2016), and Iran has 61.6 percent of people with obesity among the seven Middle Eastern countries, according to the report of the WHO in 2016, weight and 25.8% obese (WHO, 2019). The World Health Organization has defined obesity as abnormal body mass and a critical risk factor for health (WHO, 2009). Research has also shown that obesity is the main cause of many serious diseases, such as diabetes, cardiovascular diseases, cancers, and strokes is known as the sixth cause of disease worldwide, which is related to the reduction of life expectancy and the importance of individual and economic factors (Jasim Shehab et al., 2025).

Despite scientific advances in the field of health, obesity is still considered one of the most important problems of the current century among men and especially women (Pasha et al., 2014). Therefore, during the last decade, obesity and the identification of risk factors and protective factors (environmental, biological, and psychological) have been significant topics in clinical research and have been emphasized as one of the effective aspects in the treatment of obesity.

Risk factors include all factors (biological, environmental, psychological) that increase the incidence of disease by being exposed to risk factors (Butcher et al., 2014, translated by Seyed Mohammadi, 2017). What has turned obesity into a global problem today is the presence of risk factors such as various stressors in people's

lifestyles from childhood to adulthood (Tirgar et al., 2023; Nijhawan et al., 2019), which is also reported more often in women (Gasadi Qazvini & Kayani, 2017). Stress is formed as a result of the relationship with genetic and environmental factors and is associated with many negative emotions that can predict obesity (Zarza-Ribolo et al., 2021). A stressful lifestyle using changes in hormonal mechanisms is considered a risk factor in causing obesity, which is often associated with cravings for eating (Conklin et al., 2019), and emotional eating is more common among women (Rommel et al., 2012). Many people tend to overeat and especially eat high-calorie food when they are stressed (Salehi & Asadollahi, 2023; Taylor, 2020). In line with this finding, research results showed that adolescents, especially teenage girls, consume high-fat foods when stressed (Francis et al., 2024). Binge eating affects the perception of body image and the formation of self-concept (Cernelic-Bizjak, 2019). Therefore, the perception of obesity as a mental representation of the body leads to the formation and negative beliefs (Hagan et al., 2020., Serpell et al., 2020), unfavorable self-concept and the occurrence of negative emotions such as anxiety, depression, shame (Morales et al., 2025; Muha et al., 2025; Rabiei et al., 2023; Cifuentes et al., 2022; Silva, 2020) and self-criticism (Jones et al., 2018), which can act as a risk factor and reinforce obesity and negatively impact on eating behavior (Arenas & Martinez, 2016).

In contrast to risk factors, researchers are looking for factors that can play an effective role in preventing and reducing disease and protecting people's health (Butcher et al., 2014; translated by Seyed Mohammadi, 2017). Today, machine societies are rapidly moving towards urbanization, immobility, and stressful lifestyles with high-calorie fast food diets (WHO, 2018). According to the World Health Organization, physical activity helps reduce body fat and prevents many chronic diseases as a protective factor. Therefore, people should devote at least 75 to 150 minutes per week to moderate or vigorous physical activity to stay physically active. However, more than 25% of the world's adults do not meet this requirement and do not have enough physical activity (WHO, 2018). In Iran, data from three national studies show that more than 80% of people have a sedentary lifestyle (Charkazi et al., 2014) and nearly half of women over 15 years old have an inactive lifestyle (Tabatabai et al., 2017).

Another one of the most significant indicators that can be effective as a protective factor in the regulation of negative emotions and eating behavior is self-efficacy (Forman et al., 2016). Albert Bandura (1977) believes that self-efficacy is defined as a person's belief in their capacity to manage and perform tasks, which can be part of the foundation of personal success in performance, emotion regulation, and eating behavior (Bjorkman et al., 2022). Therefore, the amount of effort that a person uses in regulating emotions and negative beliefs affects the choice of activity and performance (Dorling et al., 2019). If the result of comparing the performance of the current self with the possible selves is good, people will feel good about themselves, and their self-esteem will be positive. But if the comparison is unfavorable, they will feel bad about themselves, and their self-esteem will be negative. In other words, success in performance leads to the formation of a sense of worth (Oyang et al., 2020). Since the presence of anxiety, emotions, and negative beliefs can predict overeating (Lin et al., 2025), high levels of self-efficacy can be a positive factor in changing eating behaviors and increasing self-esteem (Carraca et al., 2018).

In general, due to the widespread prevalence of obesity, which have investigated the role of biological and environmental factors in the occurrence and persistence of obesity (Jasim Shehab et al., 2025; J. Stark et al., 2025; Francis et al., 2024; Anto et al., 2020; Ryu et al., 2019; Hosseinpanah et al., 2016) we can acknowledge that what is evident in the results of the conducted researches is that in identifying the risk and protective factors

of obesity, researchers have mainly focused on the correlation of various biological and environmental factors with body mass index. There are limited studies in the field of psychology on the relationship mechanism between psychological variables and body mass index. Therefore, conducting this research is critical in that by using BMI as a criterion, we intend to investigate the mechanism of the effect of psychological factors on body mass index and determine which of the common risk and protective factors are involved. It can be related to obesity. Which variables can predict the variance of body mass index as risk and protective factors? Undoubtedly, identifying the factors of obesity can facilitate the treatment process.

Method

Participants

The statistical population included all obese and overweight women with a BMI≥25 who were in the age range of 20-40 years and used one of the virtual platforms (Telegram and WhatsApp) in 2022. The research sample was 429 overweight and obese women in 2022 who were selected voluntarily. Informed consent, having overweight criteria based on BMI ≥ 25, at least a diploma education, and an age range of 20 to 40 years were the criteria for entering the research. Also, the exclusion criteria included suffering from special psychiatric and medical problems and simultaneous psychological and drug treatment.

Ethical statement

Ethical statements included rreceived the code of ethics under the number IR.IAU.RASHT.REC.1399.085, informed consent and voluntary participation, maintaining privacy and confidentiality, explaining provided by the researcher for the conscious entry or exit of the ethical considerations of the present study.

Measures

BMI body mass index: The World Health Organization uses this index to determine obesity, according to which people with a BMI>30 are obese, BMI25-30 is overweight, those with a BMI of 20- 25 are of normal weight, and those with a BMI<20 have anorexia nervosa (DSM, 2013, translated by Ganji).

Beck's Physical Activity Questionnaire: This questionnaire was created by Beck (1982) to evaluate the level of physical activity. The questionnaire has 16 items. The range of answers in the sub-component is scored on a five-point Likert scale: never (1), always (5). The validity of the test was reported as 0.95 based on the internal consistency of this test (Beck, 1982). The reliability coefficient of the test in Iranian studies using Cronbach's alpha is reported to be 0.78 (Tavakoli Khormizi & Azarniweh, 2015). The reliability of the questionnaire in the present study was obtained with an internal consistency coefficient and logical equivalence method using Cronbach's alpha formula of 0.79.

Eating Disorder Core Beliefs Questionnaire: This questionnaire was created by Cooper et al. (1997) to evaluate the perceptions and beliefs associated with eating disorders. This questionnaire has 32 items. The validity of the questionnaire has been reported using the internal correlation between its components in the range of 0.59 to 0.95 (Cooper et al., 1997). In the research of Hosseinzadeh et al. (2012), the reliability coefficient of the questionnaire was obtained using Cronbach's alpha in the range of 0.65 to 0.85. The reliability of the questionnaire in the present study was obtained with an internal consistency coefficient and logical equivalence method using Cronbach's alpha formula of 0.93.

Self-criticism questionnaire: This questionnaire was created by Gilbert et al. (2004) to measure self-criticism and a person's ability to provide self-assurance. This scale consists of 22 items and three sub-components, two

of which are related to forms of self-criticism: self-inadequacy and self-loathing, and one sub-component is related to self-assurance. The answer to each item is set on a 5-point Likert scale from: completely disagree (0) to completely agree (4). The reliability coefficient of the questionnaire has been reported with Cronbach's alpha of 0.90 (Taklavi & Farshi, 2017). The reliability of the questionnaire in the present study, with an internal consistency coefficient and logical equivalence method using Cronbach's alpha formula, was 0.73. And for the sub-components of self-inadequacy, self-assurance, and self-loathing, it was 0.86, 0.89, and 0.88, respectively.

Shame and guilt scale: This scale was created by Cohen et al. (2011), which has 16 items and two components of shame and guilt. This scale is defined in a 5-point range from rarely (1) to very much (5). Cohen et al. (2011) obtained a favorable alpha coefficient between 0.61 and 0.71 in two separate studies. The reliability coefficient of this questionnaire in Iranian research was obtained using Cronbach's alpha for guilt, shame, and the whole scale, respectively, 0.82, 0.79, and 0.86, which indicates good reliability for the subscales and the total scale. It is the scale of feelings of shame and guilt (Hashmi et al., 2017). The reliability of the questionnaire in the present study was obtained with an internal consistency coefficient and logical equivalence method using Cronbach's alpha formula of 0.71.

Self-esteem scale: This scale was created by Rosenberg (1965) to measure self-esteem and includes 10 self-report items. The answers to each of the items have been designed in a round-the-clock fashion. Positive answers to items 1 to 5, +1 point, negative answers to items 1 to 5, 1 point, positive answers to items 6 to 10, 1 point, and negative answers to items 6 to 10, 10 points will receive +1 mark. The algebraic sum of the items determines the level of self-esteem. Confirmation factor analysis of this questionnaire in Beshlideh et al.'s research (2012) shows the validity of the construct. The reliability coefficient of this questionnaire was also reported in the research of Beshlideh et al. (2012) with a Cronbach's alpha of 0.87. The reliability of the questionnaire in the present study was obtained with an internal consistency coefficient of 0.85 using Cronbach's alpha method.

***Body Image Concern Questionnaire*:** This questionnaire was designed by Littleton et al. (2005) to assess concern about body shape perception and contains 19 items. The range of answers is on a 5-point Likert scale from: never (1) to always (5). The minimum score is 19, the average score is 57, and the highest score is 95. In Rahmanian et al.'s research (2018), the internal consistency of the questionnaire was reported to be 0.87 using Cronbach's alpha. The reliability of the questionnaire in the present study was obtained with an internal consistency coefficient and logical equivalence method using Cronbach's alpha formula of 0.95.

***Stress-anxiety-depression questionnaire*:** The stress-anxiety-depression questionnaire was created by Lavibond and Lavibond (1995) to measure stress-anxiety-depression, which has 21 items. DASS-21 questionnaire includes three sub-components: "depression, anxiety, and stress". The questions of this questionnaire are scored on a 4-point Likert scale from zero (does not apply to me at all) to 3 (completely applies to me). Lavibond and Lavibond (1995) declared the validity of the questionnaire to be 0.77. Rezaeian et al. (2017) reported the reliability of the components of this questionnaire with a Cronbach's alpha of 0.93. In the present study, the internal consistency coefficient of this questionnaire, Cronbach's alpha, was 0.94, and for its components, in the range of 0.85 to 0.90.

Weight Self-Efficacy Questionnaire: This questionnaire was created by Clark et al. (1991) to measure the ability of self-control among obese people seeking treatment, which includes 20 items. The internal consistency

coefficients for the components were obtained in the range of 0.70 to 0.90. Regarding concurrent validity, the correlation of its total scores with the total scores of the self-control ability to eat scale is 0.67 (Clark et al., 1991). In the research of Kalantari et al. (2015), the coefficient of internal consistency of the components of this questionnaire was reported by the Cronbach's alpha method in the range of 0.50 to 0.85 and 0.85 for the entire questionnaire. The internal consistency coefficient of this questionnaire was obtained by the Cronbach's alpha method of 0.95.

Procedure

After receiving the code of conduct under the number IR.IAU.RASHT.REC.1399.085 and a letter of introduction from the Islamic Azad University of Rasht, referring to the obesity treatment centers of Qazvin province, and coordinating with the managers of the treatment centers, the sample in question, observing the entry and exit conditions, was chosen voluntarily. The participants responded to the questionnaires online by sending a link to the therapy groups of one of the Telegram or WhatsApp platforms.

Results

In the present study, 429 women with a body mass index above 25, with an average age of 31.72 and a standard deviation of 6.31, participated. Of these, 105 people are in the age range of 20-25 years (24.4%), 70 people are in the age range of 26-30 years (16.31%), and 95 people are in the age range of 31-35 years (22.14%). And 159 people were in the age range of 36-40 years (37.06%). Before implementing the regression statistical method, its presuppositions, the normality of the variables using skewness/kurtosis and Kolmogrof/ Smirnov, the independence of the residuals using Durbin-Watson's statistic, and the linearity of the variables using tolerance and VIF were investigated. The results showed that the assumptions are valid.

In Table 1, descriptive information (mean, standard deviation, skewness, skewness, minimum and maximum scores) related to body mass index (BMI) variables, and components of eating beliefs, self-criticism, body image, shame and guilt, self-esteem, Self-efficacy, activity, depression, anxiety and stress have been reported.

Table 1. Descriptive information

variable	Mean	SD	minimum	maximum	skewness	kurtosis	K.S	sig
BMI	28/25	3/53	24	42	1/54	1/98	0/022	0/200
Eating beliefs	819/36	534/47	0	2516	0/89	0/56	0/034	0/200
Self-criticism	32/02	11/69	0	60	0/02	0/08	0/024	0/200
Body image	42/86	15/77	19	95	0/80	0/13	0/026	0/200
shame	36/38	6/71	19	59	0/82	0/86	0/024	0/200
depression	12/40	5/37	7	28	1/08	0/30	0/024	0/200
anxiety	11/45	4/34	5	28	1/21	1/25	0/026	0/200
Stress	14/51	5/46	7	61	0/61	-0/36	0/021	0/200
Self-esteem	7/71	2/59	0	10	-1/28	0/78	0/026	0/200
Wight Self-Efficacy	107/07	43/21	0	180	-0/33	-0/43	0/020	0/200
Activity	46/10	11/83	20	83	0/50	0/45	0/032	0/200

In Table 1, descriptive information (mean, standard deviation, skewness, kurtosis, minimum and maximum scores) related to the variables is reported.

Table 2. Correlation matrix

variable	1	2	3	4	5	6	7	8	9	10	11
1- BMI	1										
2- Eating beliefs	0/22**	1									
3- Self-criticism	0/19**	0/51**	1								
4- Body image	0/16**	0/67**	0/47**	1							
5- shame	0/05	0/40**	0/48**	0/45**	1						
6- depression	0/10*	0/60**	0/49**	0/59**	0/55**	1					
7- anxiety	0/13**	0/45**	0/46**	0/50**	0/48**	0/69**	1				
8- Stress	0/21**	0/56**	0/59**	0/61**	0/50**	0/75**	0/70**	1			
9- Self-esteem	-0/11*	-0/59**	-0/51**	-0/56**	-0/56**	-0/72**	-0/54**	-0/67**	1		
10- Self-Efficacy	-0/18	-0/28	-0/12	-0/31	-0/13	-0/21	-0/15	-0/24	0/24	1	
11- Activity	-0/12	-0/23	-0/21	-0/24	0/08	-0/23	-0/21	-0/26	0/22	0/21	1

Table 2 shows the correlation of the studied variables.

Table 3. Regression coefficients of body mass index based on variables of obesity risk and protective factors

factors	Model	R^2	F (P)	B	SE	β	T	sig	Tol	VIF	DW
Obesity risk factors	Constant	-	-	26/47	0/47	-	55/87	0/01	-	-	1/84
	1- Eating beliefs	0/04	21/85 (0/01)	0/001	0/000	0/207	3/44	0/001	0/60	1/65	
	2- Stress	0/06	13/56 (0/01)	0/167	0/047	0/25	3/57	0/01	0/41	2/40	
	3- depression	0/07	11/96 (0/01)	-0/142	0/049	-0/21	-2/88	0/004	0/38	2/59	
Obesity protective factors	Constant	-	-	29/85	0/45	-	66/39	0/01	-	-	1/79
	1- Self-Efficacy	0/03	14/66 (0/01)	-0/015	0/004	-0/18	-3/83	0/01	1	1	

The results listed in Table 3 show that among the predictor variables, risk components, eating beliefs, and stress positively and depression negatively predict body mass index. These variables explain a total of 7% of body mass index. Eating beliefs and stress have the highest regression effect on body mass index with standard beta coefficients of 0.20 and 0.25, respectively, and depression with a standard beta coefficient of- -0.21. This means that with a unit increase in the eating beliefs and stress component, there is a 0.20 and 0.25-unit increase in the body mass index, respectively. Also, with a one-unit increase in the depression component, the body mass index decreases by -0.21 units ($P<0.01$). Also, according to the results of Table 3, among the variables predicting protective components, self-efficacy was able to negatively predict body mass index. Self-efficacy could predict body mass index with one step and A beta coefficient of -0.18. In other words, with a one-unit

increase in the self-efficacy component, the body mass index decreases by -0.18 units (P<0.01).

Discussion and Conclusion

The present study was conducted to identify the risk and protective factors of obesity in women. The obtained results indicated that the negative belief of eating as a risk factor is more than other variables, and in line with them, has the predictive power of body mass index. The obtained result can be explained based on consistent studies (Francis et al., 2024; Hagan et al., 2020; Taylor, 2020; Jones et al., 2018) and Beck's theory of negative beliefs (1979) in such a way that negative beliefs about health and habitual thinking patterns are very general and are pervasive and occur as a result of lack of personal control and failure to achieve the goal. Therefore, the source of control is one of the most important structures related to obesity, which determines the cycle of inconsistent beliefs about the amount of control over eating.

Therefore, the source of people's ability to exercise personal control can be predicted in two ways. Efficacy expectation (judgment about the ability to perform the task) and outcome expectation (judgment about the result of a certain action). Negative efficacy-expectancy self-beliefs are often bipolar and absolute, such as "I will never succeed at anything." Therefore, the majority of people who have negative beliefs cannot engage in healthy behaviors and cognitive evaluations. In describing these conditions, we can mention two cognitive errors (attention bias and Delboeuf error) that create a vicious cycle of failure, self-criticism, and negative emotions. Paying attention to food-rewarding stimuli such as smell and taste may be the cause of non-homeostatic eating and maintenance of overweight and obesity. Smell, taste, and eating divert attention away from negative emotions (Francis et al., 2024; Hagan et al., 2020; Jones et al., 2018). Since the capacity of human memory is limited, for cognitive evaluations, it is necessary to focus on preferred choices. Therefore, secret responses to the smell and taste of food, such as the secretion of saliva or gastric juice, distract from the negative excitement and replace it with a positive and pleasant experience.

In other words, eating may be considered a catalyst that modifies negative emotions. In addition to attention bias, Delboeuf's perception error of the size and smallness of the food dish also affects the cognitive evaluation and eating behavior and the amount of food (Wansink & Van-Ittersum, 2013). On the other hand, people with rumination and negative beliefs cannot judge the outcome of their actions. For example, if a thought with the content of "I am hungry" comes to someone's mind, it will trigger other negative beliefs such as "I can't stand it" or "I have to eat something", and then the person will get nervous and start to overeat. Obesity is the result of continuous overeating (Serpell et al., 2020).

Another finding of the present study indicated that stress can predict an increase in body mass index. This finding is in line with the results of some research (Morales et al., 2025; Francis et al., 2024; Salehi & Asadollahi, 2023; Cifuentes et al., 2022; Klatzkin et al., 2019). In the explanation, it seems necessary to consider physical and psychological stress, such as illness, marital conflict, failure, social exclusion, etc., which are a part of everyday life. These stressors cause disturbances in physiological, cognitive, and behavioral dimensions. In the physiological dimension, stressful events in life and early stress can cause periods of depression and anxiety in adulthood. And with more activation of the sympathetic nervous system and hypothalamus-pituitary-adrenal axis and cortisol levels, specific effects are put on the central fat. Biological factors can be mentioned in the description of this process. In stressful and anxious situations, the fight or flight phase, epinephrine is secreted more than norepinephrine, which strengthens the blood flow sent to the muscles, leads to the release

of glucose in the blood, which affects the metabolism and dopaminergic activity. It affects and increases the motivation to eat and absorb pleasant foods (Morales et al., 2025; Sinha & Jastreboff, 2013).

In addition, in the cognitive dimension, stress can weaken the self-regulation strategies that are necessary to control eating. This weakening of the function interferes with the brain regions responsible for self-regulation and, in the behavioral dimension, changes in the pattern of eating behavior, sleep pattern, and mobility. Eating is a way to calm down and deal with stress and anxiety (Deckers, 2018), which, in line with the escape model, assumes that some people use eating as a way to escape from emotional turmoil. In the modern world, the majority of stressors are psychological, such as conflicts between spouses or jobs, or money worries. With such stressors, the body still responds as physical stressors (Deckers, 2018). In this condition, the body accumulates excess energy in the form of fat. The results of Cifuentes et al.'s research (2022) also showed that people who are weak in eating management due to stress and anxiety also have low self-esteem. This issue shows a vicious cycle in which glucocorticoid function, with cortisol secretion of obesity, stress, and anxiety, communicates with each other and reinforces each other, and this is one of the most difficult factors to correct in the treatment of obesity.

In addition, another finding of the research showed that depression can predict a decrease in body mass index. This finding is in line with the results of some research (Muha et al., 2024; Zarza-Rebulo et al., 2021; Silva et al., 2020). In explaining this finding, we can point to specific events that lead to depression. These events mainly include the content of loss and failure, which result in the occurrence of symptoms on three cognitive, physiological, and motivational levels. Depressed people feel futility, emptiness, and despair in the cognitive dimension. They criticize themselves with useless and irrational labels. These wrong and pessimistic beliefs about oneself lead to wrong decisions and disrupt physiological symptoms such as sleep, appetite, sexual activity, and movement, which lead to a lack of motivation, a lack of pleasure from pleasurable activities, and sadness. It continues. Therefore, anorexia and a lack of desire to eat food are associated with weight loss. On the other hand, this disorder can lead to poor performance in the social environment, a decrease in energy level, dissatisfaction with life, fatigue, and even suicide.

Psychological pathways such as stigma or low self-esteem, discrimination based on weight, low social participation, and weak social support are prone to create a vicious cycle of depression that can affect eating and weight. In other words, depression is a debilitating condition with genetic, epigenetic, and environmental contributions that can manifest in various ways and modulate homeostatic functions such as appetite and sleep, and in turn, alter mood. It plays an important role in eating (Fulton et al., 2021). However, despite the well-studied clinical outcomes of obesity, its psychological outcomes, such as depression, are not well understood. The results of a meta-analysis showed that depression has a stronger relationship with obesity than overweight (Muha et al., 2025; Luppino et al., 2010). Therefore, the relationship between weight and depression may follow a dose-response pattern. It should also be noted that the risk of depression is higher in some races than in others (Assari et al., 2015).

Another finding of the present study indicated that self-efficacy as a protective factor can predict the reduction of body mass index. In other words, increasing self-efficacy scores leads to a decrease in obesity among women. The obtained findings can be explained based on consistent studies (Lin et al., 2025; J. Stark et al., 2025; Bjorkman et al., 2022; Dorling et al., 2019) and the self-efficacy theory of Albert Bandura (1977), in such a way that self-efficacy is a personal judgment of one's ability to be successful in facing events It is

different (Bjorkman et al., 2022). In other words, a person's assessment of his ability in a specific situation, according to the amount of effort that he uses, affects his performance, quality of thinking, decision-making in choosing an active lifestyle, and emotional reactions. People with a high sense of efficacy firmly believe that they can make effective decisions with their analytical thinking when faced with stressful situations (Lin et al., 2025). Therefore, self-efficacy is one of the concepts that can attract a lot of attention in weight loss programs (Dorling et al., 2019). Self-efficacious people tend to perceive having an ideal weight and a high quality of life (Nickel et al., 2017).

Since self-efficacy in weight loss is strongly related to self-regulation skills for weight management, especially eating behavior, physical activity, and self-esteem, it can help people control eating in challenging situations (Flolo et al., 2014). People may perceive that a specific behavior (restricted eating) will lead to a certain outcome (weight loss). However, such knowledge does not influence their (eating) behavior unless they believe in their ability to consistently adhere to it (Flolo et al., 2019). Research results have also shown that environmental factors (for example, food availability, or personal factors, such as previous weight loss experience) do not directly affect a person's eating behavior; Rather, they affect a person's self-confidence in achieving the desired weight loss. Previous mastery or previous unsuccessful behavioral experiences may increase or inhibit self-efficacy, respectively, and as a result, performance leads to an increase or decrease in self-esteem (Forman et al., 2016). Self-efficacy is related to positive emotions, effective problem-solving, life satisfaction, motivation, and self-esteem. Therefore, higher positive affect may lead to feeling more control over the environment and higher self-efficacy in weight management and a sense of worth (Flolo et al., 2019). According to the findings of the present study and the review of the results of similar studies, it can be concluded that environmental, biological, and psychological factors play a role as risk and protective factors in the incidence and prevalence of obesity, which is expanding in the world. Factors such as negative beliefs, stress, depression, and self-efficacy that are exposed to can affect the occurrence or protection of obesity. These factors may be different in different societies according to social, economic, cultural, and climatic factors. Therefore, identifying these factors that interact with each other can help therapists in choosing the appropriate treatment.

Voluntary sampling, not considering the social, economic, and cultural situations, and virtual implementation, can be considered limitations of the current research. The results of this study and similar studies can be used in obesity treatment centers by using new methods of psychological treatments along with other treatments to improve obesity and increase awareness of eating behavior.

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