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Comparison between Mindfulness, Body Consciousness and Stress in Obese and Normal-Weight People

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Obesity is one of the health problems in the last century. The aim of this study is to compare mindfulness, body consciousness and stress in obese and normal-weight people. The population of the study included all obese people who visited diet and weight loss centers in Rasht city and normal-weight people. Two hundred individuals (100 obese and 100 normal-weight people) were selected using convenience sampling method. Research data was collected using mindfulness questionnaire by Baer, Smith & Allen (2004), body consciousness questionnaire by Miller et al (1981), and depression, anxiety, and stress questionnaire by Lovibond & Lovibond (1995), and was analyzed using independent t-test. The results revealed significant difference in mindfulness scores between two groups, that is, obese people have lower mindfulness and more stress than normal-weight people. However, no significant difference was observed between two groups in terms of body consciousness. Increase mindfulness and managing stress, as two influential factors on obese patients, can improve their physical and mental health, and reduce their weight.

Keywords: mindfulness, body consciousness, stress, obese people and normal-weight people

Obesity is one of the 10 most common health problems worldwide and its prevalence is increasing in all age groups and in most countries. Obesity is considered as a threat to human

health and is defined as excessive and abnormal fat accumulation (World Health Organization, 2011). Severely obese people usually suffer from serious health problems like diabetes, high blood pressure, high cholesterol, asthma, arthritis (Mokdad et al, 2003) and they even experience reduced life expectancy (Finkelstein, Brown, Wrage, Allaire & Hoerger, 2010; Fontaine, Redden, Wang, Westfall & Allison, 2003). Obesity has a bilateral relationship with emotional pressures, psychological disorders and psychiatric status of the person. Psychiatric disorders, acute mental stress and more chronic psychological and personality problems can cause obesity and overweight. On the other hand, obesity, itself, would have adverse psychological consequences and causes dissatisfaction with life (Brownell). Although psychological factors are obviously important in the development of obesity, it is not comprehensively and clearly explained to what extent these factors contribute to obesity.

It seems that mindfulness is one of the influencing factors in obesity development. Langer believes that mindfulness is a creative cognitive process and it becomes evident when the person uses three key characteristics of mood including new categorization, openness to new information and having more diverse and deeper view (Singh et al, 2006). Mindfulness is characterized by immediate, continuous and non-evaluative awareness and consciousness about psychological processes and includes continuous awareness of physical sensations, perceptions, emotions, thoughts and imaginations (Wells, 2002).

Studies have shown that mindfulness has significant positive relation with restrained eating behavior style and significant negative relation with emotional and external eating behavior styles (Ouwens, Schiffer, Visser, Raeijmaekers & Nyklíček, 2015) and it plays a mediating role in the relationship between

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eating behavior and psychological distress (Clementi, 2015). Most studies have suggested that mindfulness-based interventions are effective in reducing and changing eating behaviors that lead to extreme obesity such as extreme overeating, emotional eating, and eating under the influence of external stimulus. They are also effective in reducing weight, improving metabolic health in obese people and reducing overweight (O'Reilly, Cook, Spruijt-Metz & Black, 2014; Kristeller, Wolever, & Sheets, 2014; Daubenmier et al, 2016, Musavian et al, 2011).

The other contributing factor in obesity is body consciousness. Body consciousness involves focusing attention and awareness of the body's inner feelings (Gavin & Moore, 2010), capacity to understand and distinguish information received from all the sense organs, including deep receptors in muscles and joints (Bekker, Croon, van Balkom & Vermee, 2008). Body consciousness is the mental and phenomenological aspect of proprioception and visceral feeling which is perceived consciously and is reflected and changeable via mental processes such as attention, interpretation, evaluation, beliefs, memories, conditioning, attitudes and emotions. In fact, it is considered as a capacity interacting with all physical, mental and emotional aspects of a human being (Gyllensten, 2010).

Increasing body consciousness is proved to be important in physical health and treatment of people with drug abuse, eating disorders, chronic pain (Anderson & Lawrence, 2006), positive response of body, a good impression of body and body comfort. For instance, women’s poor body consciousness reduces the connection between their mind and body in such a way that their self-worth depends on their physical appearance and this would have negative impact on their mental health (Menzel, 2010).

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Increased body consciousness causes improvements in managing weight loss (Anderson & Lawrence, 2006) and is recommended as a solution for those who are suffering from chronic problems such as extreme obesity (Mehling, Wrubel, Daubenmire & Price, 2011), since the weaknesses resulting from body consciousness lead to several problems such as self-dissatisfaction and eating disorders (Dittmann, 2008).

Another variable that is closely related with obesity is stress. Stress has positive relation with weight gain, fattening eating behaviors including higher energy consumption, higher saturated fat and sugar consumption, poor food quality, uncontrolled eating behavior and emotional eating behavior. Stress would increase physiological responses independent from eating behaviors and diets such as cortisol (Lee & Farid, 2014), and therefore it may affect severe obesity through the following ways: 1) eating behaviors and diet quality, 2) biological processes. There are still few studies that can distinguish the relationship between stress and severe obesity through eating behaviors and diet quality from other danger-related factors of stress which are independent of diet. A path from stress to severe obesity may be through eating behaviors (Greeno & Wing, 1994), if people tend to have unhealthy and fattening eating behaviors, they are using them as means of dealing with stress. In spite of natural stress, high perceived stress is accompanied with low quality diet (Fowles, Stang, Bryant & Kim, 2012), eating more fast foods and less fruits (Ansari, Adetunji & Oskrochi, 2014; Liu et al, 2007), increased unrestrained eating behavior (Haynes, Lee & Yeomans, 2003), and overeating (Pendleton et al, 2001). More chronic stressors and high perceived stress with higher overall energy consumption and recent perceived stress would be accompanied with lower food quality. There is a higher chance of developing obesity when

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a person experiences more than three chronic stressors, compared to when there is no such stressor (Isasi et al, 2015).

By studying mindfulness, body consciousness and stress in obese and normal-weight people, the style of dealing with problems in overweight people can be investigated pathologically. Considering increasing rate of obesity and variety of ways to reduce obesity, it is difficult to find a way that is best suited for individuals' needs. The results of this study can help design new ways of reducing harmful effects of overweight and obesity. Therefore, the main question of this research is to find whether mentioned factors, mindfulness and stress and body consciousness, in obese people is different from those of normal-weight people.

Method

The population of this study included all obese people who visited diet and weight loss centers in Rasht city. One hundred individuals were selected using convenience sampling method and were screened in consultation with dieticians. One hundred normal-weight individuals with the same age and sex, matched with obese group, were selected randomly from Rasht city. Finally, the samples which consisted of 200 individuals (ranging from 18 to 40 years old, 121 women and 79 men) were determined. A number of 5.4% of subjects were underweight (BMI < 20), 36% were in ideal condition (BMI= 20-25), 10% were overweight (BMI= 25-30), 37% were obese (BMI= 40-30) and 12.5% had severe obesity (BMI > 40). Before analyzing the data, normal distribution assumptions of data and homogeneity of variance were evaluated and confirmed using independent t-test (using Kolmogorov-Smirnov test) and Levene test, respectively.

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Five Facet Mindfulness Questionnaire (FFMQ)

The self-rating scale included 39 items that has been developed by Baer et al (2004) which is evolved by combining propositions from Freiburg Mindfulness Inventory (Walach, Buchheld, Buttenmuller, Kleinknecht & Schmidth, 2006), Mindful Attention Awareness Scale (Brown & Ryan, 2003), Kanchuki Mindfulness Scale (Baer et al, 2004), Revised Cognitive and Affective Mindfulness Scale (Kumar et al, 2005), and Southampton Mindfulness Questionnaire (Chadwick et al, 2007) and using factor analysis. Factors obtained based on Baer et al. (2004) factor analysis included observation, practice with consciousness, being non-judgmental toward inner experience, description and being non-responsive. Internal consistency of factors were satisfactory and alpha coefficient ranged between .75 (for the factor "being non-responsive") to .91 (for the factor "description"). There was a moderate correlation between factors and it was significant in all cases and ranged from .15 to .34 (Neuser, 2010; as cited in Ahmadvand, Heidarinasab, Shoeiri, 2012). In a study on the validation of this questionnaire which was conducted in Iran, the test-retest correlation of FFMQ questionnaire ranged between r=.57 (for the factor "being non-judgmental") and r=.84 (for the factor "observation"). Alpha coefficients were also satisfactory (ranging between .55 for the factor "being non-responsive" and .83 for the factor "description") (Ahmadvand et al, 2012).

Body Consciousness Questionnaire (BCQ)

Body consciousness questionnaire by Miller, Murphy and Buss (1981) is a 15-item self-reporting scale about private aspects of an individual's body, for instance, "I'm sensitive to internal

tensions", and public aspects, for example, "I am fully aware of most important and worst parts of my appearance". Questionnaire items are rated based on a 1-to-5 Likert scale, 4 means completely true and 0 means not at all. So high scores indicate higher levels of physical truth. Private body consciousness is the most common sub-scale that is used in body consciousness questionnaires and the average amount of its reliability and validity is .64, .64 and 0.60 in a sample of hemodialysis patients, in a sample including ballerinas and non-ballerinas and in a sample of women and men, respectively. The reliability of private body consciousness and public body consciousness is .99 and .73, respectively in the retest. Mirzajani and Nikoogoftar's study (2015) translated this questionnaire to Persian. In order to determine the reliability and validity of the translated version of BCQ questionnaire, he did a questionnaire survey among 10 patients with diabetes and the resulted Cronbach's alpha for private and public body consciousness were .57 and .66, respectively. The internal consistency of data in their study was .92.

Depression, Anxiety, Stress Scale (DASS)

Depression, Anxiety, Stress Scale (DASS) was developed by Lovibond & Lovibond (1995; as cited by Fathi, Ashtiani & Dastani, 2009). This questionnaire consists of 21 multiple questions. 0 means "not at all", 1 means "a little", 2 means "average", and 3 means "much". Seven questions are allocated for each factor. Antony, Bieling, Enns and Swinson (1998) conducted a factor analysis on this scale and the results confirmed the existence of three factors (anxiety, stress, and depression). Their alpha coefficient is .97, .92, and .95, respectively. This questionnaire was examined by Samani, Jokar, and Sahragard (2007) and the following values were obtained for retest

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reliability of depression, anxiety and stress scale, respectively: .80, .76, and .77 and their alpha were equal to .81, .74, and .78, respectively (as cited by Karami, Zokaee, Alikhani & Khodadadi, 2011).

Results

Totally, 100 obese and 100 normal-weight individuals participated in the study and their ratio was equal. The BMI for obese group was 37.99 and for normal-weight group was 23.03.

As observed in the Table 1, the average of all mindfulness variable components including observation, description, and practice with consciousness, being non-judgmental about inner experience and being non-responsive to inner experience and the stress are higher in obese people than normal-weight people and this difference was statistically significant with 95% confidence. Nevertheless, the average for body consciousness was almost the same in two groups and no significant difference was observed.

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Table 1
Comparing the Mean Value of Mindfulness, Body Consciousness and Stress in Obese and Normal People

	Variable		Mean	Variance	Means' difference	T value	Degree of freedom	Level of significance
Mindfulness	observation	normal	31.27	4.23	3.22	5.459	198	.001
		obese	28.05	4.11				
	description	normal	24.32	3.66	5.21	4.770	198	.001
		obese	21.81	3.77				
	Practice with consciousness	normal	25.02	5.52	1.42	2.185	198	.032
		obese	26.44	3.57				
	Being non-judgmental about inner experience	normal	27.72	4.75	1.32	2.109	198	.036
		obese	26.40	4.07				
	Being non-responsive to inner experience	normal	24.92	3.49	2.70	5.643	198	.001
		obese	22.22	3.26				
	General mindfulness	normal	133.25	13.52	8.33	4.441	198	.001
		obese	124.92	12.99				
	Body awareness	normal	55.15	6.95	.05	.056	198	.995
		obese	55.20	5.59				
	Stress	normal	15	3.66	1.14	2.08	198	.038
		obese	16.14	4.05				

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Discussion

The purpose of this study was to compare the mindfulness, body consciousness and stress in obese and normal-weight people. The results showed that there is a significant difference in the mindfulness of obese and normal people. In other words, obese individuals has significantly lower mindfulness compared to normal people.

These findings are in line with the results of research conducted by Musavian et al (2010), Daubenmier et al (2016), Kristeller et al (2014), O'Reilly, G.A et al (2014) that investigated the effects of promotion and mindfulness-based interventions in reducing obesity, metabolic health improvements in obese people, significant weight loss in obese people, reduction or change of eating behaviors that lead to extreme obesity, respectively. For explaining these findings, it can be said that extreme overeating is characterized by significant unbalance in food consumption and it is usually accompanied with extreme obesity and depression. Therefore, approaches that operate based on mindfulness can reduce forced overeating by concentrating on behavioral and emotional disorder and internalizing changes. Therefore, people who do not have sufficient control over their eating behaviors and in times of stress and pressure of everyday lives tend to show extreme eating behaviors, have poor mindfulness compared to normal people, thus suffer from problems such as overweight and obesity. Excessive and unusual food consumption in a period of time are some indicators of eating disorder and obesity, and in this situation, person feels his eating behavior is out of his control. On the other hand and in psychological explanation of obesity, emotional eating behavior has been mentioned and it has been explained that people sometimes turn to overeating in order to avoid their own

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unpleasant emotions or in case of failure in achieving perfection and ambitions. Mindfulness makes patients aware about the roots of disorder and its mechanism in the brain, prevents stress and anxiety, and focuses on his thoughts and desires in conscious state of mind to help that person not to repeat his actions, thoughts, and eating in order to reduce his stress and to think about biological roots of eating disorders. Therefore, it can be expected that obese people have lower mindfulness skills than normal people.

The second finding of this research is that there is a significant difference in the amount of stress in obese and normal-weight people, that is, obese people experience more stress than people with normal weight. This finding is consistent with research conducted by Block et al (2009), Sims et al (2008), Barrington et al (2014), and Isasi et al (2015). According to these studies, stress is accompanied with tendency toward eating foods with higher calories, saturated fat, and sugar and also with uncontrolled and emotional eating. In explaining the relationship between stress and obesity, it can be said that obese people use fattening eating behaviors as a tool for dealing with stress. In other words, the more stress is experienced by the person, the more he becomes unable to restrain eating (Haynes et al, 2003) and this inability leads to consumption of low quality foods (Fowles et al, 2012), fast foods (Ansari et al, 2014), and finally overeating (Pendleton et al, 2001). We can expect these behaviors to lead to overweight and obesity.

The final findings of the present research showed that there is no significant difference in body consciousness between obese and normal-weight people. This finding is not consistent with the findings of Anderson & Lawrence (2006) and Menzel (2010). Lack of significant difference in body consciousness between obese and normal-weight people is in contrast with the fact that

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increasing body consciousness will improve weight management in obese people (Anderson & Lawrence, 2006). To explain these findings, we can note the participants' conditions when completing the questionnaire, since in every paper-pencil questionnaire survey for measuring participants' mental and behavioral characteristics, participants' conditions when completing questionnaire may affect the results and the reality may be distorted in self-report questionnaire. Thus, given the contradictions of findings of the present and previous research, it is necessary to do more research in order to further examine the accuracy of findings. Menzel's findings (2010) are not consistent with this research's findings; because his research entitled "role of body consciousness in body image and mental health of women" showed that poor body consciousness in women causes reduction in body-mind connection, therefore they see their worth in maintaining their physical appearance and their mental health to be affected by it. Gavin that Menzel (2010) reached such conclusion only about women, it can be said that gender can be a determinant factor in body consciousness of people. Gavin that the researcher does not consider gender as a factor in this research, further research can be done to determine to what extent the body consciousness of men and women would be determinant and how gender would affect both sexes' eating habits.

According to the present research and past findings, it seems that a way of preventing obesity, obesity reduction and weight control, is to improve mindfulness skills and stress management strategies. In this regard, it is recommended that diet centers, clinics, health centers, counseling centers of schools, ministry of education and universities provide people with training courses for developing techniques of mindfulness and stress management in order to play a role in controlling eating behaviors, preventing

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obesity and consequently improving society's physical, mental and social health. It should be noted that one of the limitations of this study is that the subjects were selected using convenience sampling, so we should be cautious about generalizing the results for all obese people of the community.

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