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The relationship between eating patterns, body image and emotional dysregulation: similarities between an excessive and normal body weight sample

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Summary

Aim. The objective of the present study was to evaluate the relationship between eating patterns, body image and emotional dysregulation among individuals with excessive and normal body weight.

Method. A total of 298 participants completed the online survey. The following four questionnaires have been used in the present study: the Body Attitude Test, the Three-Factor Eating Questionnaire, the Difficulties in Emotion Regulation Scale and the Mindful Eating Scale.

Results. In both groups (excessive weight versus normal body weight), higher levels of body dissatisfaction have been foreseen based on the higher levels of uncontrolled eating and lower levels of mindful eating. However, among patients with overweight and obesity, the relationship between these variables was stronger and there was an additional significant predictor in the regression model (emotional eating). This model explained the body dissatisfaction variances to a larger extent (excessive body weight: 59% versus normal body weight: 49%). In addition, the mindful eating was of a paramount importance among patients with excessive body weight. The evidence of this was the significant moderating effect of mindful eating in the relationship between body dissatisfaction and restrictive eating as well as emotional dysregulation but only in an overweight and obese sample.

Conclusions. To sum up, in order to increase the effectiveness of treatment of body image disorders, abnormal eating patterns and emotional dysregulation among patients with overweight and obesity the therapeutic processes should put emphasis on mindful eating skills.

Key words: eating patterns, body dissatisfaction, emotional dysregulation

Introduction

In the past years, a growing body of evidence has shown a significant relationship between body image, eating patterns and emotional functioning among clinical (e.g. patients with obesity or eating disorders) and nonclinical groups [1-6]. In both patients with excessive body weight and in the group of normal body weight individuals, a high level of maladaptive eating patterns (e.g. binge eating, emotional eating, unhealthy dietary restraint) is associated with high levels of emotional dysregulation [4, 6, 7], a high level of body dissatisfaction [3] and a low level of mindful eating [8].

With respect to abnormal eating behaviours [9, 10], three eating styles (emotional, uncontrolled and restrictive) will be considered in the context of the present research. Each of these eating styles contains a pathological aspect [11-13] as follows: (1) too frequent eating under emotions and stress (emotional eating) [12, 14], (2) loss of control over the rate and amount of food consumed (uncontrolled eating) [15] and (3) unhealthy restriction of food intake (restrictive eating) [4].

According to Marks' Homeostatic Theory of Obesity [16], apart from body dissatisfaction (defined as a negative self-assessment of one's body connected with social comparison, hiding one's body under loose clothing and being jealous of other people's appearances) [3, 17, 18] and abnormal eating patterns, there is an important (in aetiology of obesity) high level of negative emotions associated with emotional dysregulation. A previous research study has shown that emotional dysregulation mediates the relationship between emotional eating and internalisation of weight [19]. This concept (emotional dysregulation) is defined as difficulty in receiving, processing and displaying emotions and a lack of adaptive coping with emotions and stress [20]. Research focusing on the relationship between controlling emotions and emotional eating in individuals with obesity showed that these individuals found it more difficult to identify their emotional state in comparison to healthy people [21]. Furthermore, among obese women, the difficulties in identifying their emotional states and experiencing negative emotions were related to emotional eating. Therefore, negative emotions can play an important role in emotional eating, and maladaptive coping with emotions may be the mechanism initiating obesity [21].

It is worth noting the crucial role of a subsequent variable – mindful eating – for emotional dysregulation, maladaptive eating patterns and body image [22-25]. This construct is termed as the non-judgmental awareness of physical and emotional sensations related to (consuming) food [26]. This awareness is associated with thoughts, impressions and emotions along with external sensations about food. Mindful eating relates to the awareness during eating a meal, perceiving its appearance and feeling its taste, consistency and structure, and the awareness of external and internal triggers of satiety or hunger and one's own emotions [27, 28]. Furthermore, this concept includes the following characteristics: (1) conscious food intake focusing on bodily symptoms of hunger and satiety, (2) elimination of "being on automatic pilot" and dichotomisation of a "good food" and "forbidden food", and (3) differentiating physical and emotional hunger [8, 29-31]. Interestingly, a large number of studies show that mindful eating is effective in the treatment of body image disturbance, unhealthy eating patterns and emotional dysregulation both in clinically overweight and obese samples [8, 30-33] and in individuals with normal body weight

[9, 34]. The role of mindfulness as a moderator between emotional eating and distress was verified in existing research [35]. There is evidence to indicate that a higher level of mindfulness is connected with a higher level of awareness of eating patterns and a lower level of stress, depression and emotional eating [35].

In line with current studies, it was assumed that the level of body dissatisfaction can be predicted on the basis of eating styles, mindful eating and emotional dysregulation in individuals with overweight/obesity and normal weight. In addition, it was assumed that in the absence of a direct relationship between body dissatisfaction and the other above-mentioned variables, mindful eating will be an important moderator of these relationships for patients with excessive body weight and for subjects with normal body weight. The present study focused on investigation of similarities in both groups.

Material and methods

Participants

Individuals were recruited through advertisements in institutions that treat individuals with excessive body weight or eating disorders and at universities and various workplaces (e.g. offices). Individuals did not receive any financial compensation for their participation. Two hundred and fifty-seven women and 53 men participated in the present study. The eligibility criteria were as follows: (1) BMI $\geq$ 25 kg/m^2 for participants with excessive body weight (clinical sample) and (2) 18.5 kg/m^2 $\leq$ BMI $\geq$ 24.99 kg/m^2 for individuals with normal body weight (non-clinical sample). Finally, 298 participants (N_{WOMEN} = 245, N_{MEN} = 53) met the above-mentioned criteria. Detailed participants' characteristics are shown in Table 1.

Table 1. **Descriptive statistics**

Demographic characteristics		
	Excessive body weight *N* = 184	Normal body weight *N* = 114
	M (*SD*)	
BMI (kg/m^2)	29.74 (3.76)	22.11 (1.71)
Age (years)[1]	33.88 (9.45)	34.21 (9.55)
Clinical characteristics		
	N (%)	
	Excessive body weight	Normal body weight
Diagnosis of mental disorders		
Anorexia nervosa	0	1 (0.88)
Bulimia nervosa	7 (3.80)	1 (0.88)
Other eating disorders	7 (3.80)	0
Depression	7 (3.80)	0
Bipolar affective disorder	0	1 (0.88)
Neurosis	1 (0.54)	0

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Diagnosis of physical illness		
Yes	34 (18.48)	23 (20.18)
No	150 (81.52)	91 (79.82)
Medication		
Yes	38 (20.65)	25 (21.93)
No	146 (79.35)	89 (78.07)

Note. [1] There are no statistically significant differences between the groups.

In individuals with excessive body mass, the following somatic diseases were most frequently mentioned: thyroid disorders ($N = 9$), arterial hypertension ($N = 5$), spine disorders ($N = 5$), Hashimoto's thyroiditis ($N = 3$) and arthritis ($N = 3$), whereas individuals with normal body weight listed: thyroid disorders ($N = 6$), multiple sclerosis ($N = 4$), Hashimoto's thyroiditis ($N = 3$), endocrine disorders ($N = 2$) and reflux ($N = 2$).

The research was approved by the local ethics committee.

Measures

The following four questionnaires were used in the study: the Body Attitude Test [36], the Three-Factor Eating Questionnaire [37], the Difficulties in Emotion Regulation Scale [38] and the Mindful Eating Scale [39].

Body Attitude Test

The Body Attitude Test was applied to measure body attitudes and experiences [36]. This questionnaire includes three subscales: (1) a negative appreciation of body size, (2) general body dissatisfaction and (3) lack of familiarity with own body. In the present study, the Polish 20-item version of the questionnaire was used [17]. Only the body dissatisfaction scale was employed (Cronbach's alpha = 0.90). The higher the score, the greater the body dissatisfaction.

Three-Factor Eating Questionnaire

The Three-Factor Eating Questionnaire was originally developed by Karlsson et al. [37] to measure emotional, uncontrolled and restrictive eating. In the present study, the Polish 18-item version of the questionnaire was used [40]. All the above-mentioned subscales were employed (Cronbach's $\text{alpha}_{\text{emotional}} = 0.79$, Cronbach's $\text{alpha}_{\text{uncontrolled}} = 0.90$, Cronbach's $\text{alpha}_{\text{restrictive}} = 0.90$). The higher scores indicate more emotional, uncontrolled and restrictive eating.

Difficulties in Emotion Regulation Scale

To assess the level of emotional dysregulation, the Difficulties in Emotion Regulation Scale was used [38]. This questionnaire includes 36 items and assesses the overall level of emotional dysregulation using six subscales: difficulty in engaging in a goal-directed behaviour, non-acceptance of emotional responses, lack of emotional awareness, impulse control difficulties, limited access to emotion regulation strategies and lack of emotional clarity [38]. In this study, the overall level of emotional dysregulation was used (Cronbach's alpha = 0.96). Higher scores indicate greater difficulties with emotion regulation.

Mindful Eating Scale

The Mindful Eating Scale consists of 28 items and assesses overall mindfulness in the domain of eating patterns and in six subscales: (1) awareness, (2) acceptance, (3) distractibility, (4) non-reactivity, (5) routine and (6) unstructured eating [39]. In this study, the overall mindfulness score was used (Cronbach's alpha = 0.91). The higher the sum of scores, the greater the mindful eating.

Statistical analysis

The Statistical Package for Social Sciences (version 22.0) was used for data analysis. In relation to the first aim of the study – assess predictors of body dissatisfaction – a multiple linear regression was used. To analyse the second purpose – a moderating effect of mindful eating – macro PROCESS [41] with bootstrap $N = 10{,}000$ was employed. However, to create figures and tables, the Hayes guidelines were applied [41].

Results

Regression analysis

With regard to the predictor analysis of body dissatisfaction among individuals with excessive body weight, $F(5, 178) = 53.99$, $p < 0.001$ and normal body weight, $F(5, 108) = 23.53$, $p < 0.001$, a multiple linear regression was used (Tables 2 and 3).

Table 2. **Excessive body weight: model prediction of body dissatisfaction**

	β		Adjusted *R2*
Emotional eating	0.159**		
Restrictive eating	-0.028		
Uncontrolled eating	0.253***		0.59
Mindful eating	-0.522***		
Emotional dysregulation	-0.052		

Note. $^{**}p < 0.01$, $^{***}p < 0.001$

Table 3. **Normal body weight: model prediction of body dissatisfaction**

	β		Adjusted *R2*
Emotional eating	0.045		
Restrictive eating	-0.092		
Uncontrolled eating	0.296*		0.49
Mindful eating	-0.339*		
Emotional dysregulation	0.181		

Note. $^{*}p < 0.05$

Moderating effect

Because of the lack of a significant direct relationship between body dissatisfaction and restrictive eating and emotional dysregulation among participants with excessive body weight, the procedure of moderation described by Hayes [41] was used. Regarding the moderating effect of mindful eating in the overweight and obese sample, there was a significant moderator in the relationship between body dissatisfaction and restrictive eating, $R = 0.45$, $F(3, 180) = 15.48$, $p < 0.001$, $MSE = 20.45$, and emotional dysregulation, $R = 0.74$, $F(3, 180) = 72.87$, $p < 0.001$, $MSE = 376.18$ (Table 4, Figures 1 and 2).

Table 4. **Excessive body weight: mindful eating as a moderator in the relationship between body dissatisfaction and restrictive eating as well as emotional dysregulation**

	Effect	*t*	LLCI	ULCI
Restrictive eating				
-1 *SD*	-0.56***	-4.12	-0.82	-0.30
M	-0.28**	-2.74	-0.48	-0.08
+1 *SD*	0.01	0.05	-0.18	0.19
Emotional dysregulation				
-1 *SD*	1.36*	2.34	0.22	2.51
M	0.73	1.68	-0.13	1.58
+1 *SD*	0.09	0.24	-0.70	0.88

Note. $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

As there was a non-significant direct relationship between body dissatisfaction and restrictive eating, emotional eating and emotional dysregulation among participants with normal body weight, the procedure of moderation described by Hayes [41] was used. With regard to the moderating effect of mindful eating in a normal body weight sample, there was no significant moderator in the relationship between body dissatisfaction and restrictive eating, $R = 0.68$, $F(3, 110) = 31.67$, $p < 0.001$, $MSE = 10.78$, emotional eat-

ing, $R = 0.69$, $F(3, 110) = 33.44$, $p < 0.001$, $MSE = 3.04$, and emotional dysregulation, $R = 0.76$, $F(3, 110) = 48.53$, $p < 0.001$, $MSE = 258.75$ (Table 5, Figures 3-5).

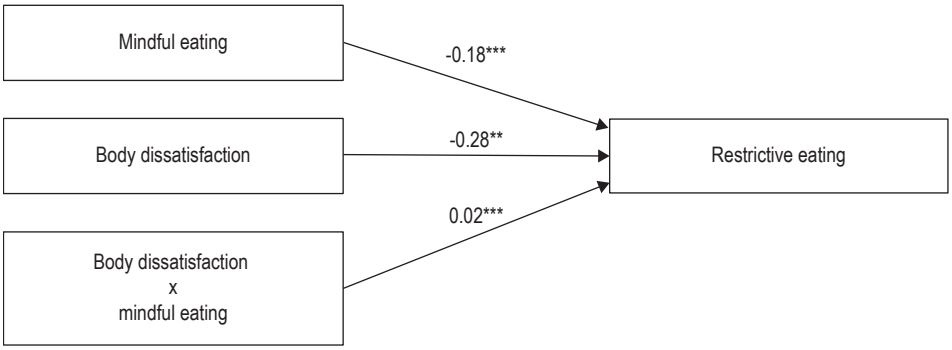

Figure 1. **Excessive body weight: moderating effect of mindful eating for body dissatisfaction and restrictive eating**

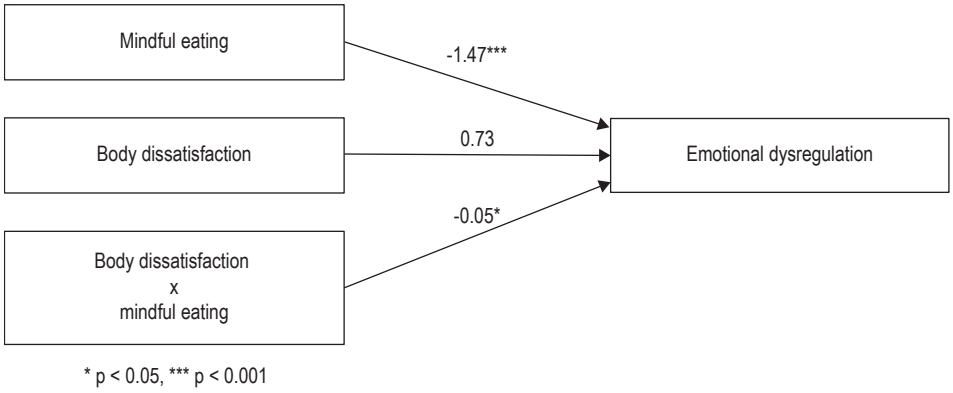

Figure 2. **Excessive body weight: moderating effect of mindful eating for body dissatisfaction and emotional dysregulation**

Table 5. **Normal body weight: mindful eating as a moderator in the relationship between body dissatisfaction and restrictive eating, emotional eating as well as emotional dysregulation**

	Effect	*t*	LLCI	ULCI
Restrictive eating				
-1 *SD*	-0.11	-1.07	-0.32	0.09
M	-0.03	-0.36	-0.21	0.15

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+1 *SD*	0.05	0.38	-0.19	0.28
Emotional eating				
-1 *SD*	0.09	1.72	-0.02	0.20
M	0.06	1.32	-0.03	0.16
+1 *SD*	0.03	0.54	-0.09	0.16
Emotional dysregulation				
-1 *SD*	0.77	1.53	-0.23	1.77
M	1.07**	2.40	0.19	1.96
+1 *SD*	1.37**	2.36	0.22	2.52

Note. $^{**}p < 0.01$

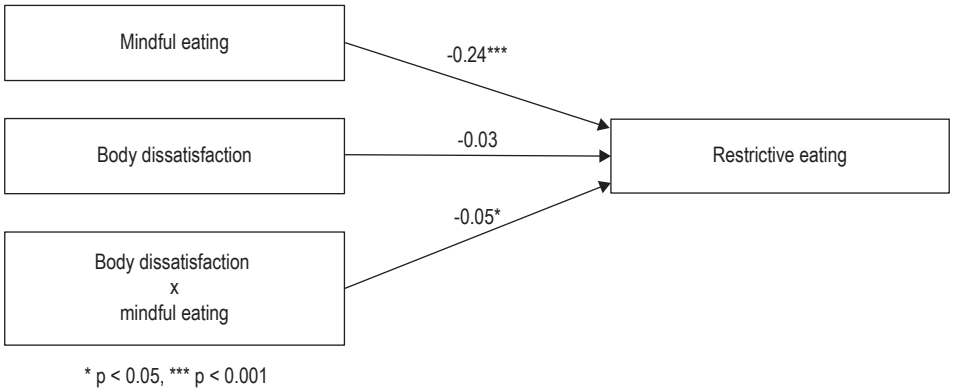

Figure 3. **Normal body weight: moderating effect of mindful eating for body dissatisfaction and restrictive eating**

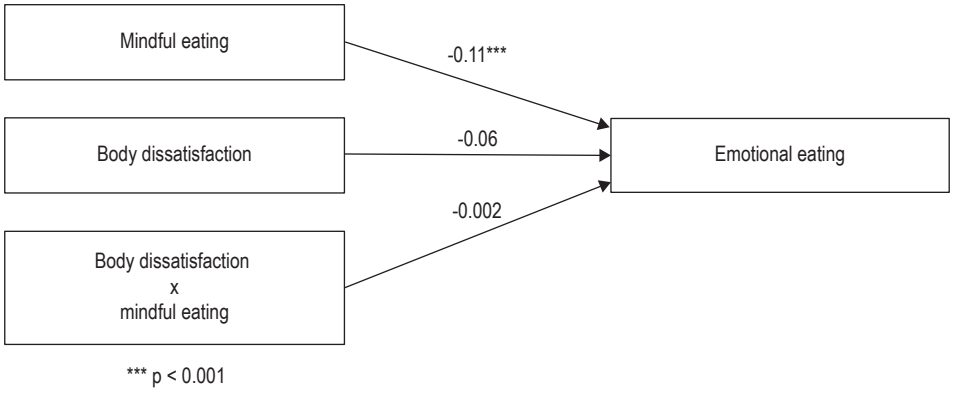

Figure 4. **Normal body weight: moderating effect of mindful eating for body dissatisfaction and emotional eating**

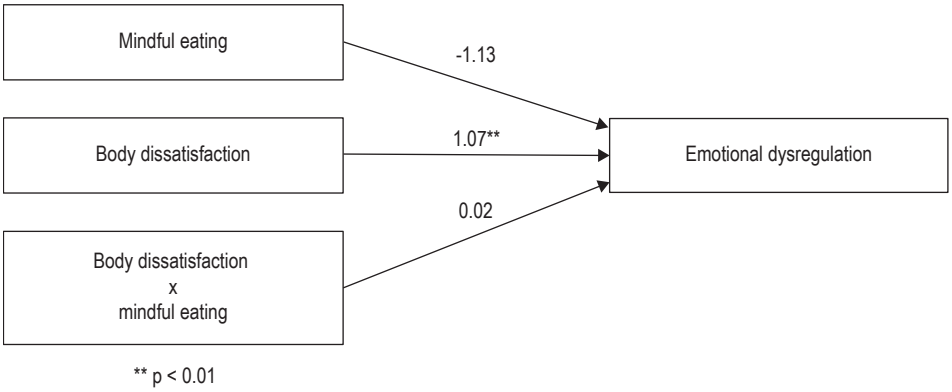

Figure 5. **Normal body weight: moderating effect of mindful eating for body dissatisfaction and emotional dysregulation**

Discussion

In line with our findings, similarities were observed in the field of predictors in both groups. In both groups, i.e. individuals with excessive weight and individuals with normal body weight, a high level of body dissatisfaction was foreseen based on a high level of uncontrolled eating and a low level of mindful eating. However, for overweight and obese patients, relationships between variables were stronger and there was an additional significant predictor in the regression model (emotional eating). This model explains the body dissatisfaction variances to a larger extent (excessive body weight: 59% versus normal body weight: 49%).

In addition, in the context of the relationship among attitudes towards the body, eating styles and emotional functioning, the present study's results provide support for other researchers' assumption [8, 29] that mindful eating is of paramount importance for patients with excessive body weight. This is evident from the significant moderating effect of mindful eating in the relationship between body dissatisfaction and restrictive eating and emotional dysregulation that was observed only in the overweight and obese sample. At this point, it is worth noting that mindful eating does not moderate any of these relationships among people with normal body weight. Hence, it can be concluded that this variable does not play a significant role in changing the relationship between self-attitude towards the body and eating styles and emotional functioning in this group. Therefore, future research should focus on searching for other moderating effect variables in this group.

In the context of the above-mentioned findings, it is worth mentioning that the research shows a statistically significant lower level of body dissatisfaction, emotional, restrictive, uncontrolled eating and emotional dysregulation in individuals with normal body weight when compared to the overweight and obese group [42]. Regarding this research and our present study findings, a possible explanation is persistent abnormal eating habits [25]. It can be assumed that people with normal body weight use food to

occasionally reduce negative emotions and stress, whereas for overweight and obese patients this tendency is chronic [25]. Hence, in the first of the above-mentioned groups, no alterations in mindful eating will change the relationship between body dissatisfaction, eating styles and emotional dysregulation, and, as the past research shows, the influence of social environment [43], chronic bullying victimisation [44] and body appreciation [45] is critical.

Furthermore, authors using mindful eating techniques consider these habits to be particularly assistive and effective in the treatment of patients with excessive body weight [8, 29-31]. Interestingly, previous research also confirms the beneficial effects of mindful eating techniques on physical health in the group with excessive body weight [29, 46, 47]. Following this line of reasoning, it is worth presenting the possible ways that the influence of mindfulness eating training, and a mindfulness-based approach on eating patterns can improve emotional functioning and body image. Mindfulness-based eating awareness training, whose effectiveness is confirmed by research (including patients with excessive body weight), suggests subsequent exemplary techniques for: (1) developing healthy eating patterns: mindfully eating raisins, mindfully finishing a meal; (2) shaping adaptive emotional functioning: identification and tolerance of emotional triggers, identification of emotional eating; and (3) self-acceptance of body: body scan practice, forgiveness meditation [8, 30].

The obtained results may be explained in terms of the influence of mindful eating techniques on the ability to manage one's cognitive resources. Awareness of the mechanism of the vicious circle between the introduction of dietary restrictions and increasing the probability of binge eating in stressful situations (due to self-control depletion) along with the development of a non-judgemental attitude to thoughts are techniques by which the patients develop the above-mentioned cognitive skills [25]. This is in line with Pearson et al.'s [48] findings that suggest that based on the level of self-control depletion (connected with higher eating restraint and negative emotions), the level of binge eating can be foreseen but only among individuals with a high intensity of emotional eating (it is worth highlighting here that many studies confirm that the level of emotional eating is higher in people with excessive body weight than in individuals with normal body weight) [42, 49].

The present study has several limitations. The studied groups were gender-heterogeneous (82.2% of women vs 17.8% of men). Because of the small sample size of men, taking into account the division into normal body weight and excessive body weight ($N < 30$) [41], gender-specific statistics were not presented in the current study. In future studies, the male population should be larger and equal to the female population, and the number of people with excessive and normal body mass should be uniform. Moreover, it is worth considering including individuals with anorexia and bulimia nervosa to better understand how mindfulness impacts eating disorders and assess whether this influence is different than in the group of people with normal and excessive body weight. The self-report questionnaires should be enriched with objective measurement (e.g. apart from BMI, body composition analysis using bioelectrical impedance analysis).

Conclusions

To summarise, in order to increase the effectiveness of treatment of body image disorders, abnormal eating patterns and emotional dysregulation among overweight and obese patients, emphasis should be placed on mindful eating skills. The results obtained in this study are concordant with those of previous publications [21, 50, 51] – developing and practising an attitude of mindfulness can improve the skill of changing eating patterns in response to negative emotions.

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