ORIGINAL RESEARCH PAPER

Mindfulness trait, eating behaviours and body uneasiness: A case-control study of binge eating disorder

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ABSTRACT. BACKGROUND: *Binge eating disorder (BED) is a complex and multifaceted eating disorder, and the literature indicates that BED patients show greater difficulty in identifying and making sense of emotional states, and that they have limited access to emotion regulation strategies. Findings show many links between mindfulness and emotional regulation, however there has been no previous research on mindfulness traits in BED patients.* **METHOD:** *One hundred fifty BED patients (N=150: women=98, men=52; age 49.3±4.1) were matched for gender, age, marital status and educational level with 150 non-bingeing obese and 150 normal-weight subjects. All were assessed with the Five Facet Mindfulness Questionnaire (FFMQ), Binge Eating Scale (BES), Objective bulimic episodes (EDE-OBEs) and Body Uneasiness Test (BUT). For all the participants past or current meditation experience was an exclusion criteria.* **RESULTS:** *Findings showed that Mindfulness-global, Non reactivity to experience, Acting with awareness, Describing with words and Observation of experience scores were significantly lower in BED than control groups ($p<0.05$). However, on the mindfulness measures, the obese control group did not differ from the normal weight control group. Moreover, correlations showed that mindfulness was more widely negatively correlated with the BED's OBEs, BES and BUT-GSI scores. Meanwhile, binge eating behaviours, frequency and severity (OBEs and BES) were more negatively correlated with action (Non-reactivity-to-experience and Acting-with-awareness scores). Body Uneasiness was more negatively correlated with mental processes (Describing-with-words and Observation-of-experience) and mindfulness features.* **CONCLUSION:** *Implications on understanding of the mechanisms underlying the development and maintenance of problematic eating in BED were considered. Moreover, clinical considerations on treatment targets of mindfulness-based eating awareness training were discussed.*

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INTRODUCTION

Binge eating disorder (BED) is a complex and multifaceted eating disorder (1), first described by Stunkard (2), and included by DSM-IV in 1994 (3) as a provisional eating disorder. Currently, BED is being considered for inclusion in the next DSM-V because several studies demonstrated its clinical significance and validity (4). Despite controlled studies have shown that therapies are effective in eliminating binge eating and reducing associated psychopathology (5-7), they have a limited effect on body weight (8-10). Recent research (11) seems to support a model of binge eating that includes emotional vulnerability and a deficit of skills that functionally modulate negative emotions, a mechanism shared with addictive behaviours (12).

BED shares many characteristics with addictive behaviours (e.g., diminished emotional control, continued use despite negative consequences), and a body of scientific literature is building to support addiction conceptualizations of eating (13, 14). Emotional awareness and regulation are two common factors which appear to be the key common factors in both BED and food addiction (12). Indeed, findings seem to corroborate a model of binge eating that includes emotional vulnerability and a deficit of skills that functionally modulates negative moods. Data from a large sample population indicate that emotion regulation difficulties are most strongly associated with binge eating independently from sex,

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food restriction and over-evaluation of weight and shape (11). Moreover, other findings show that BED seems to be triggered by an immediate break-down of emotion regulation (15). Again, preliminary results of treatment focused on increasing recognition and regulation of negative emotion on BED (16) show that binge abstinence rates following treatment (post-treatment and 1 year follow-up were 78% and 87% respectively) were comparable to other empirically supported treatments for BED. Overall, the research results indicate that BED patients show greater difficulty identifying and making sense of emotional states, and limited access to emotion regulation strategies.

In accordance to this emotional, behavioural and physiological dysregulation perspective of the mechanisms underlying the development and maintenance of dysfunctional eating patterns in BED, recently, a Mindfulness-Based Eating Awareness Training (MB-EAT) was designed to address the following issues: controlling responses to varying emotional states; making conscious food choices; developing an awareness of hunger and satiety cues; and cultivating self-acceptance (17).

The mindfulness trait can be defined as a psychological stable cognitive skills that allows to bring complete attention to the present perceptions and experience on a moment-to-moment basis in a nonjudgmental and nonreactive manner (18). Mindfulness has its roots in meditative experience of Buddhist practices and philosophy (18), finalized to control attention to a greater extent, to better perceive events as they occur, to view distressing thoughts and feelings as transitory in nature, and to regulate the mind in a controlled manner (19). From Buddhist meditation practice, psychologists have increasingly contended that people should naturally differ in the qualities that compose mindfulness (20).

On the basis of such theoretical characterizations, the vast majority of efforts to develop dispositional scales for mindfulness at least started with a multifactor conception Psychometric results suggest that the observing and nonreactivity facets of dispositional mindfulness reflect different individual difference tendencies (20). Dispositional variations in mindfulness and its facets have garnered considerable recent interest in the clinical and personality literatures (21), also supported by studies of neuroimaging (22). Findings (20) suggest the mindfulness trait being conceptualized as a five multifaceted construct: non-reactivity to internal experience, observing internal experience, acting with awareness, describing internal experience and non-judgment of experience (see Table 1).

Findings show that despite differences there are many links between mindfulness and emotional regulation (23). Mindfulness seems to be associated with greater emotion differentiation and less emotional difficulties (i.e., emotional lability and self-reported emotion dysregulation) (24), lower negative affect and overall emotional volatility (25).

Meta-analysis findings suggest that Mindfulness-based interventions are effective in treating a variety of psychological and physical conditions and to improve heath and quality of life (26). Several studies have shown positive results in the application of mindfulness in the addiction disorders treatment (27-29). Recently, findings from a study in which mindfulness treatment outcome for BED with co-existing Substance Use Disorders was investigated shows that participants significantly improved on measures of objective binge eating episodes and disordered eating attitudes (30). Moreover, evidence from an exploratory randomised controlled trial (31) and a pilot study (32) showed that eating focused mindfulness-based interventions can result in significant changes in weight and eating behaviour in obese and overweight subjects. It is possible, therefore, that the investigation of the mindfulness trait may be informative in understanding the mechanisms underlying the development and maintenance of problematic eating in BED and that this would allow to better implement targeted psychological interventions based on mindfulness features for these patients.

TABLE 1
Example items for facets of the Five Facet Mindfulness Questionnaire.

Facets	Example Items
Observation of experience	I notice the smells and aromas of things
Describing with words	Even when I'm feeling terribly upset, I can find a way to put it into words
Acting with awareness	It seems I am "running on automatic" without much awareness of what I'm doing (R)
Non judging of experience	I tell myself I shouldn't be feeling the way I'm feeling (R)
Non reactivity to experience	When I have distressing thoughts or images, I don't let myself be carried away by them

Although researchers have examined the efficacy of acceptance- and mindfulness-based interventions in the treatment of eating disorders, only one study has explored the association between trait mindfulness and eating pathology. Findings from 276 undergraduate women (33) revealed that four mindfulness facets (awareness, nonreactivity, nonjudgment, and describing) were uniquely associated with eating disorder, assessed by Eating Attitudes Test-26, and beyond anxiety and depression symptoms.

There has been no previous research on mindfulness trait in BED patients.

Therefore, the aim of this current controlled investigation was to test whether BED individuals differ in mindfulness trait from control obese and normal weight control groups. It was hypothesized that the BED group would report lower mindfulness trait than the control groups. Lastly, we predicted that mindfulness trait would be negatively associated with binge eating behaviours and body image uneasiness.

TABLE 2
Psychometric and socio-demographic characteristics of the groups. Data are presented as mean±SD or as number of cases (%).

	BED (N=150)	Obese Control (N=150)	Normal Control (N=150)
Gender, N (%)			
Males	52 (34.67%)	52 (34.67%)	52 (34.67%)
Females	98 (65.33%)	98 (65.33%)	98 (65.33%)
Marital status, N (%)			
Single	41 (27.33%)	46 (30.67%)	43 (28.67%)
Living with partner	99 (66.00%)	97 (64.67%)	100 (66.67%)
Widowed	10 (6.67%)	7 (4.67%)	13 (8.67%)
Educational level, N (%)			
Elementary school	38 (25.33%)	32 (21.33%)	36 (24.00%)
Junior high school	68 (45.33%)	73 (48.67%)	70 (46.67%)
Senior high school	24 (16%)	22 (14.67%)	22 (14.67%)
Degree	16 (10.67%)	18 (12.00%)	18 (12.00%)
Other	4 (2.67%)	5 (3.33%)	4 (2.67%)
BMI (kg/m²)	$33.1\pm1.2_a$	$33.2\pm1.8_b$	$23.2\pm1.3_{a,b}$
Age (years)	49.3±4.1	50.1±5.3	51.4±3.1

BED: Binge Eating Disorder group. Means in row sharing the same subscripts (e.g. $_a$) are significantly different (p<0.05), as calculated by Least Significant Difference Fisher post-hoc tests.

METHODS

Participants

Adults between 25 and 56 years of age who met criteria for BED (N=150: women=98; men=52) were recruited from an outpatient general health centre. Subjects in a non-bingeing obese (N=150: women=98; men=52) control group were recruited in the same manner while those in the normal-weight (N=150: women=98; men=52) group were recruited by posters placed at universities, local hospitals, and other public institutions. Table 2 shows the characteristics of the three groups. The percentages of men and women respectively (χ^2=5.108, df=2, p=0.134), of proportion of marital status (χ^2=3.276, df=3, p=0.612) and of proportion of educational level (χ^2=4.291, df=5, p=0.241) did not differ significantly among the groups. Analysis of variance (ANOVA) procedures indicated that age differences were not statistically significant ($F_{2,178}$=2.74, p=0.198). However the three groups differed significantly by design ($F_{2,178}$=86.76, p<0.001) on BMI. Both BED and the obese controls had a mean BMI in the Class I obesity range, according to World Health Organization criteria (34), and the least significant difference post hoc test indicated that BMI was significantly higher than the Normal control group (p=0.003).

Measures

Mindfulness: The Five Facet Mindfulness Questionnaire (FFMQ) (20). The FFMQ is a 39-item measure composed of subscales for Non-reactivity to internal Experience (7 items, e.g., "I perceive my feelings and emotions without having to react to them"), Acting with Awareness (8 items; e.g., "I find it difficult to stay focused on what's happening in the present"; reverse scored), Describing internal experience with Words (8 items, e.g., "I'm good at finding words to describe my feelings"), Non-judging of Experience (8 items, e.g., "I criticize myself for having irrational or inappropriate emotions"; reverse scored), and Observation of internal Experience (8 items, e.g., "I pay attention to how my emotions affect my thoughts and behaviour"). Respondents were asked to rate how true given statements are for themselves on a five-point Likert-type scale (1= rarely true to 5= very often or always true). Psychometric analyses of this measure show that it has adequate convergent validity and incremental validity in the prediction of psychological symptoms (35). Higher scores on the FFMQ reflect greater mindfulness.

Binge eating: The Binge Eating Scale (BES) (36). BES was used to assess the severity of binge eating. It examines both behavioural signs (eating large amounts of food) and feeling or cognition during a binge episode (loss of control, guilt, fear of being unable to stop eating) in 16 items (37).

Frequency of binge eating: Objective bulimic episodes (OBEs). The Eating Disorder Examination Questionnaire (EDE-Q) (38) was used to assess OBES. EDE-Q is a well-established self-report questionnaire that assesses eating disor-

der with a focus on the previous 28 days. The EDE assesses the frequency of different forms of overeating, including objective bulimic episodes (OBEs) (i.e., binge eating defined as unusually large quantities of food with a subjective sense of loss of control). It has received psychometric support, including adequate test-retest reliability (39), good convergence with the Eating Disorder Examination interview in studies of patients with BED (40, 41), and has been found to be a good screening measure in non-clinical community studies (42). Interrater reliability for the EDE was assessed using approximately 35% of interviews conducted at baseline, post-treatment, and 6-month follow-up. Kappa coefficient for diagnosis of BED was 1.0. Intraclass correlation (ICC) coefficient for OBEs was 0.87 and ranged from 0.81 to 0.95 for the EDE bulimic subscales. In addition to obtaining measured weights and heights on a medical balance beam scale, the following assessments were administered at baseline, and at post treatment (15 weeks) and 6-month follow-up assessments.

Body Uneasiness: The Body Uneasiness Test (BUT) (43). BUT was used to assess body image uneasiness. It examines body shape and/or weight dissatisfaction, avoidance, compulsive control behaviours, feelings of detachment and estrangement toward one's own body, and specific worries about particular body parts, shapes, or functions. The BUT consists of 34 items with a score ranging from 0= never to 5= always. The scores are combined in a Global Severity Index and in 5 subscales. The various subscales of BUT were not considered for the purposes of the present study. The test-retest correlation coefficients were highly significant (BUT-Global Severity Index, 0.89). Exploratory and confirmatory analyses found the same structural model for BUT-A in normal-weight individuals, in subjects without eating disorders (43), as well as in patients with obesity (44).

Procedures

Diagnostic and assessment procedures were done by trained clinical psychologists. The DSM-IV BED diagnosis was based on the *Structured Clinical Interview for DSM-IV Axis I Disorders* (SCID-I/P) (45). Interrater reliability for BED (kappa=1.0) was good. The BED diagnosis obtained using the SCID-I/P was confirmed by findings from the Binge Eating schedule of Eating Disorder Examination Interview (EDE) (46). Exclusion criteria were: any serious medical condition, not being fluent in Italian, pregnancy (or having recently given birth), if they were currently being treated for (or had a history of) any psychiatric disorder, including eating disorders and substance abuse, except for BED and non-binging obese participants who were being treated (or met criteria) for depression because of the high co-occurrence of BED, depression, and obesity; these last subjects were included. Control participants were first screened during a structured telephone interview and excluded on the basis of the same criteria for BED with the addition of criteria of currently being treated for (or having had a history of) any psychiatric disorder, including eating disorders and substance abuse. For all the participants, an exclusion criteria was if they had past or current meditation experience that was assessed by single item (e.g., *Do you have any experience with meditation?*). The procedures employed were carried out in accordance with the Declaration of Helsinki. On the day of testing, informed consent was obtained, and all relevant demographic information was obtained in a face-to-face interview. Participants then completed the questionnaire measures after which height and weight were measured. For BED participants, a structured clinical interview was carried out at the beginning of the testing session to confirm eligibility and identify comorbidities. For control participants, a brief non-patient psychiatric screening took place, which included questions about substance use, depression, and disordered eating. At the end of the study, none of the participants were paid for their participation.

Statistical analysis

Using a conditional regression model and Monte Carlo simulation, a minimum of 330 participants (110 BED, 110 Control Obese and 110 Control) was needed to detect a medium effect, assuming a 1:1:1 case-control ratio with alpha level 0.05 and power 0.80. Categorical values are expressed as frequency and percentage, while continuous values as mean±SD. For OBE data are presented as median and interquartile range. Differences in categorical variables between groups were analyzed by the Chi-Square test. Differences among groups for FFMQ, OBE, BUT-GSI and BES measures were assessed by multivariate (MANOVA), with Pillai's Trace criteria test, and univariate (ANOVA) analyses, followed by Fisher LSD post-hoc test. Correlations between FFMQ with OBE, BES and BUT-GSI scores were calculated for each groups. Due to significantly skewed and kurtotic distribution, log transformations were conducted for the OBE data. As transformations did not completely address not-normality, Kendall's tau-b not-parametric analyses were used for FFMQ (and sub-scales)

TABLE 3
Multivariate and univariate analyses of variance for FFMQ, OBE, BUT-GSI and BES measures.

	Multivariate		Univariate								
			FFMQ[b]								
Source	df	F[a]	Global	NRE	AA	DW	NJE	OE	OBE[b]	BUT-GSI[b]	BES[b]
Group	2	3.34	5.34*	3.76**	5.32*	4.64*	6.21	4.05*	9.34*	7.43*	3.56*
MSE			18.23	16.45	13.03	14.56	17.09	14.06	24.06	17.71	23.74

The Multivariate F ratio was generated from Pillai's statistic; MSE: mean squared error. FFMQ: Five Facet Mindfulness Questionnaire; NRE: Non reactivity to experience; AA: Acting with awareness; DW: Describing with words; NJE: Non judging of experience; OE: Observation of experience; OBE: Objective bulimic episodes; BUT-GSI: Body Uneasiness Test-GSI; BES: Binge Eating Scale. [a]Multivariate df = 14,300; [b]Univariate df = 2,155. *p<0.05; **p<0.01.

and OBE analyses following transformations. The FFMQ (and sub-scales) was not-normally distributed for BED, Control Obese and Normal Control participants, therefore nonparametric Kendall's tau-b were used for the FFMQ (and sub-scales) and BES and BUT-GSI. Statistical analyses were performed with SPSS version 18.0 (SPSS Institute Inc., Chicago, IL).

RESULTS

The variables of the three study groups were compared by carrying out a multivariate analysis of variance (MANOVA). The multivariate F and all the univariate F values, except for the Non judging of experience mindful sub-scale, were statistically significant (see Table 3).

Post hoc comparisons using the least significant difference test indicated that on the Mindfulness-global, Non reactivity to experience, Acting with awareness, Describing with words and Observation of experience subscales, the BED had lower mean scores than control groups. Conversely, on Objective bulimic episodes, Body Uneasiness and Binge Eating Scale measures, the BED had higher mean scores than control groups. However, on the mindfulness measures the obese control group did not differ from the normal weight control group, whereas on Objective bulimic episodes, Body Uneasiness and Binge Eating Scale measures the obese control group had higher mean scores than the Normal weight control group. Groups did not differ on the Non-judging of experience mindfulness scale. Table 4 presents means and standard deviations, and a summary of these findings.

Table 5 summarizes correlations between the Mindfulness Facets with Objective bulimic episodes, Binge Eating Scale and Body Uneasiness Test-GSI scores. Mindfulness was more widely correlated with the BED's OBEs, BES and BUT-GSI scores than in control groups. Eating behaviours (OBEs and BES) were more negatively correlated with Non-reactivity-to-experience and Acting-with-awareness. Moreover, the binge eating score was more negatively correlated also with Describing-with-words score. Instead, Body Uneasiness was more negatively correlated with Describing-with-words and Observation-of-experience scores.

DISCUSSION

This is the first study which investigates mindfulness trait in BED patients compared with non-bingeing obese and normal-weight subjects. Even though there have been some studies which investigated the outcome treatment of mindfulness based techniques in BED patients and in overweight subjects (17, 30-32),

TABLE 4
Groups differences for Five Facet Mindfulness Questionnaire (total and facets scores), Objective bulimic episodes, Body Uneasiness Test-GSI, and Binge Eating Scale measures. Data are presented as mean±SD or as [§]median [interquartile range].

	BED (N=150)	Obese Control (N=150)	Normal Control (N=150)
FFMQ - Mindfulness	105.07±22.1	123.68±24.1	124.49±24.1
Non reactivity to experience	$16.11\pm5.54_{a}$	$21.81\pm6.76_{a}$	$22.21\pm4.61_{a}$
Acting with awareness	$19.18\pm6.61_{a}$	$25.29\pm4.34_{a}$	$25.79\pm6.41_{a}$
Describing with words	$21.12\pm5.51_{a}$	$24.81\pm4.24_{a}$	$24.97\pm3.21_{a}$
Non judging of experience	26.53±6.75	26.88±4.42	27.01±5.32
Observation of experience	$22.13\pm4.23_{a}$	$24.89\pm5.81_{a}$	$24.51\pm6.21_{a}$
Objective bulimic episodes[§]	$18.1\ [3.4]_{a}$	$1.5\ [1.1]_{a,b}$	$1.0\ [0.7]_{a,b}$
Body Uneasiness Test-GSI	$2.7\pm1.1_{a}$	$1.4\pm0.8_{a,b}$	$0.8\pm0.5_{a,b}$
Binge Eating Scale	$32.6\pm5.4_{a}$	$16.4\pm4.6_{a,b}$	$13.1\pm2.1_{a,b}$

BED: Binge Eating Disorder group; FFMQ: Five Facet Mindfulness Questionnaire. Means in row sharing the same subscripts (e.g.$_{a}$) are significantly different (p<0.05), as calculated by Least Significant Difference (Fisher LSD) post-hoc tests.

TABLE 5
Correlations coefficients between FFMQ (total and facets scores) and Objective bulimic episodes (OBE), Binge Eating Scale (BES) and Body Uneasiness Test-GSI (BUT-GSI), for each groups.

	BED			Control Obese			Normal Control		
	OBE[a]	BES[b]	BUT-GSI[b]	OBE[a]	BES[b]	BUT-GSI[b]	OBE[a]	BES[b]	BUT-GSI[b]
FFMQ - Mindfulness	-0.42*	-0.37*	-0.31*	-0.12	-0.31*	-0.28*	-0.07	-0.18	-0.20*
Non reactivity to experience	-0.41*	-0.36*	-0.24	-0.13	-0.25*	-0.09	-0.07	-0.21*	-0.03
Acting with awareness	-0.51**	-0.41*	-0.21	-0.11	-0.23*	-0.07	-0.04	-0.03	-0.10
Describing with words	-0.32	-0.45**	-0.54**	-0.14	-0.29*	-0.33*	-0.10	-0.21*	-0.28*
Non judging of experience	-0.18	-0.11	-0.10	-0.07	-0.05	-0.06	-0.04	-0.03	-0.05
Observation of experience	-0.21	-0.28	-0.44**	-0.11	-0.22	-0.28*	-0.03	-0.05	-0.24*

BED: Binge Eating Disorder group; BES: Binge Eating Scale; BUT-GSI: Body Uneasiness Test-GSI; OBE: Objective Bulimic Episode; FFMQ: Five Facets Mindfulness Questionnaire. [a]Due to significantly skewed and kurtotic distribution, log transformations were conducted for the OBE data. As transformations did not completely address not-normality, Kendall's tau-b nonparametric analyses were used for FFMQ (total and sub-scales) and OBE analyses following transformations. [b]The FFMQ (total and sub-scales) was not-normally distributed for BED, Control Obese and Normal Control participants, therefore nonparametric Kendall's tau-b were used for the FFMQ (total and sub-scales), BES and BUT-GSI. *p<0.05; **p<0.01.

until now no study had investigated the mindfulness profile of BED patients with no current and past experience of meditation.

Results of the present study point out that BED patients have lower mindfulness capacities than controls. Moreover, scores on the mindfulness measures did not differ in the obese control group and the normal weight control group. This may suggest that a lower capacity in mindfulness abilities is specifically linked to binge eating more than difficulties with the regulation of food intake and the implementation of exercise, although more research needs to be done to confirm this hypothesis. These results are consistent with those that have shown that emotional awareness and regulation are key factors within the mechanisms underlying the development and maintenance of problematic eating in BED and food addiction (11, 12).

In addition to these results, our study highlights the possible specific aspects involved in the process of emotion regulation. The present findings, indeed, indicate that relatively to action, BED patients seem to be characterized by difficulties in containing their reaction to stressful internal emotional experiences and, when they act, they do so by "automatic behaviour" with low awareness. When it comes to the mental processes of mindfulness, difficulties to observe and describe by declarative mental representation the internal experience seem to characterize binge eaters in comparison to obese and normal weight subjects.

Consistent with our findings, reports show as BED patients markedly use food to handle emotional distress (47) with dysregulation of interoceptive awareness, appetite and satiety mechanisms (48).

These results are in line with other studies which indicate that these subjects are not in touch with their internal cues and that they have difficulties when it comes to recognizing and regulating their emotions (15, 16) and that psychological interventions should target these difficulties (11, 17). It is possible to hypothesize that BED patients are "disconnected" from internal experience, emotional processes and particularly the ones related to normal satiety, and that they are oversensitive to "external" cues, which causes them to react with automatic eating behavioural patterns.

This study also confirms that mindfulness was more widely negatively correlated with the frequency and severity of binge eating and body uneasiness. In particular, the eating behaviours were more negatively correlated with action features of mindfulness (Non-reactivity-to-experience and Acting-with-awareness), while body uneasiness was more negatively correlated with mental processes of mindfulness (Describing-with-words and Observation-of-experience). This indicates that the incapacity to describe one's emotional state and how this state influences thought and behaviours may have an adverse effect on body image perception. Moreover, a link is suggested between the capacity of staying focused and frequency and severity of the binge eating episodes, indicating that the incapacity to identify and regulate emotions may be not only linked with binge eating, but also its severity and frequency.

Strengths and Limitations

The generalizability of findings outside the specific area under study is undetermined. A clear limitation of this study is the exclusion criteria, which strongly limits generalisation on

population. In any case the evidences derived from this study should deserve other efforts in larger sample to better circumstantiate the associations between mindfulness trait and BED.

CONCLUSIONS AND CLINICAL CONSIDERATIONS

Even considering these limitations, it is possible to hypothesize some clinical considerations about the findings, to assume with due caution because they require corroboration. Firstly, the findings from this study bring further evidence on the appropriateness of mindfulness based techniques for BED treatment. Our findings give a contribute to better specify the targets of the BED treatment protocol based on improvement of attention and awareness by mindfulness treatment, by differentiating on the basis of binge eating severity and body uneasiness.

The importance of developing a better relationship with the self, in particular with the physical self in the treatment of BED has already been outlined in the literature (17), and this study indicates that an increase in emotional awareness may be a key component for an improved body image perception. Besides confirming the importance of emotion recognition and regulation in the treatment of BED, the importance of the capacity of staying focused in the decrease of binge eating episodes has been outlined. In conclusion, even though further research is required, the findings of the present study seem to further corroborate a model of binge eating that includes emotional vulnerability and a deficit of skills that functionally modulate negative moods.

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